EVALUATION OF BEDSIDE TEACHING IN PHARMACOLOGY: A PILOT STUDY.

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Summary

Aim/objectives: To study the impact of bedside teaching of pharmacology on student's comprehension and performance.

Materials and Methods: After taking didactic lectures on congestive cardiac failure and diabetes mellitus a batch of 2nd M.B.B.S. students was subdivided into 2 groups. The two groups were then respectively engaged in a bedside sessions on the above mentioned topics. After a gap of one week a questionnaire of 30 marks on CCF and DM was given to the entire batch and the performance evaluated statistically.

Results: The groups subjected to bedside sessions performed significantly better in the tests, than their counterparts who had attended only didactic lectures.

Conclusions: Bedside teaching of pharmacology clearly enhances understanding of the subject, which was evident from student's performance.

KEY WORDS: Bedside, didactic, performance**.**

Introduction

Pharmacology has long been considered a very volatile subject by its students. The primary objective of teaching pharmacology is to enable undergraduate medical students to take rational therapeutic decisions in clinical practice[1]. However, this objective may not be accomplished through didactic lectures alone. Hence a pilot study was carried out to determine the impact of bedside teaching of pharmacology on student's understanding and performance.

Aim: To ascertain the impact of bedside teaching on student's comprehension and performance.[2]

Objectives:

Primary:

1) To arouse interest and liking amongst the students for the subject.

Secondary:

2) Students would exhibit awareness of various drugs practically used in the treatment of Diabetes Mellitus (DM) and Congestive Cardiac Failure (CCF).
3) Students would exhibit working knowledge of principles of rational drug use in a clinical settings.[3]

Goal: To churn out proficient doctors well versed with the pharmacological basis of therapeutics.

Methods

On a pilot project initiated by us, we decided to determine the effect of bedside teaching of pharmacology on student's comprehension and performance[4]. We decided to select 2 common topics for the study namely Congestive Cardiac Failure (CCF) and Diabetes Mellitus (DM).

A didactic lecture on DM and CCF for the entire batch of 2nd M.B.B.S. students (08-09) was taken. Then the batch was divided into 2 groups; 1st group from roll no.1-50 and 2nd group from roll no.51-100.

The 1st group i.e. roll no. (1-50) was then taken for bedside session on CCF only and 2nd group for a bedside session on DM only. After a gap of 1 week a questionnaire of 30 marks on CCF and DM was given to the entire batch and the performance evaluated using Student's -t -test.

Results:

Table 1: Students-t-test for questionnaire on Congestive Cardiac Failure

Groups	n	Mean	Standard Deviation
Group 1 (Roll No.1-50)	48	17.64	4.50
Group 2 (Roll No.51-100)	49	12.71	4.47

t = 5.409
Degree of freedom (df) =95
P value=0.000
(Highly significant)

Table 2: Students-t-test for questionnaire on Diabetes Mellitus

Groups	n	Mean	Standard Deviation
Group1 (Roll No.1-50)	48	17.35	4.82
Group2 (Roll No.51-100)	50	19.38	5.57

t = 1.92
Degree of freedom (df) = 96
P value = 0.058
Statistically somewhat significant (p value < 0.1)
But by strict yardstick not significant.

Discussion

Teaching is a process, which facilitates learning by encouraging learners to think, feel and do[4]**.** Learning is an active and voluntary process which takes place in the learner's mind and which is primarily controlled by the learner. Learning is an act of experiencing and it involves thinking, feeling or doing by the learner. Acquisition of knowledge involves thinking on the part of learner and active participation in the form of questioning and discussion by the learner, which enhances learning. The need for active participation of the learner during acquisition of skills and practical knowledge is even more obvious. Hence, teaching-learning activities should involve learners actively for the acquisition of both knowledge and skills.

Meaning orientation is sacrosanct of learning, in which knowledge and skills are learnt with understanding. Meaningful learning leads to a deep level of understanding in contrast to rote learning which is associated with only superficial understanding. Meaningful understanding necessitates interlinking of ideas within a topic and interrelating to other parts of the course.

Deep approach to learning includes meaning orientation, interrelating ideas and intrinsic motivation[5,6,7]. It is to be preferred over surface approach, which is characterized by an orientation to reproduce information at examinations and extrinsic motivation.

For optimum learning, the students should acquire the professional skills and knowledge under real-life situations[8]. They should be confronted with real-life problems and real-life situations. They should understand pharmacotherapy using patient's symptoms, signs and investigation results. Similarly, students should be able to perform essential practical skills on patients after preparatory instructions and demonstrations. One of the greatest motivations in bedside learning is the achievement of acquiring new clinical skills[9].

One of the theories of learning, which plays a major role in a bedside session, is **Theory of connectionism**. It explains learning in terms of the formation and strengthening of bonds or neural connections between stimuli and responses. Some of the laws of Theory of connectionism, which are applicable in such sessions, are

i) The Law of Exercise: Use or exercise strengthens learning (Law of Use) and disuse or lack of exercise weakens learning (Law of Disuse).

ii) The Law of Effect: If the effects of learning are satisfying, the learning is embossed in the mind and if the effects or the outcome of learning are annoying or boring, the learning is stamped out.

iii) The Law of Belongingness: Meaningfully interrelated acts are learnt more easily than a collection of unrelated acts. Integrated or bedside learning are important applications of this Law[10].

Bedside learning also involves linking of multiple previously learned responses.

Taxonomy of educational objectives:

1) **Cognitive Domain**: Concerned with description of learning designed to acquire, recall or recognize knowledge and the development of intellectual abilities and skills of the students (domain of intellectual skills)[11].

Simplified classification: a) Knowledge b) Understanding c) Application.

Example: At the end of the session on CCF and DM, students shall be able to

i) List the common drugs used in the treatment of DM and CCF (knowledge).

ii) Categorize the patient into Type 1/Type 2 DM or 4 grades of Heart Failure (understanding).

iii) Plan an individualized therapy for a given patient with DM/CCF.

2) **Affective Domain**: Deals with description of learning tasks concerning changes in interests, attitudes, values and development of appreciation and adequate adjustments (domain of communication skills)[12,13].

Simplified classification: a) Receiving b) responding c) Internalisation.

Example: At the end of the session on CCF and DM, students shall be able to

i) Show awareness of the anxiety of a patient about to undergo insulin therapy/dopamine infusion (receiving).

ii) Comfort the patient by verbal or non-verbal communication (responding).

iii) Habitually comfort and counsel the patients about to undergo change in therapy.

3) **Psychomotor Domain**: Deals with acquisition of physical abilities, motor skills, manipulation of materials and objects or acts requiring a neuromuscular coordination (domain of practical skills)[14].
Simplified classification: a) Imitation b) Practice under supervision/guidance. c) Performance with high degree of skill.
Example: At the end of the session on CCF and DM, students shall be able to

i) Use various types of Insulin delivery devices/infusion pump under supervision (imitation) and (practice).

ii) To show confidence in Insulin administration to his patients and to be able to educate patients about insulin usage (proficiency).

Didactic lectures have retained its popularity amongst students due to familiarity and an opportunity to remain dormant and passive in comparative safety due to lack of appreciation of the possible advantages of alternative methods of teaching[15].

Advantages of Bedside teaching:

1) Active learning process.
2) Limited group of learners.
3) Permits evaluation of all 3 domains.
4) Bridges the gap between theoretical learning and practical reality.
5) Develops qualities of scientific thought (observation, problem solving and decision making)[16,17].
6) Facilitates 2-way communication between the teacher and learner, better scope of sharing relevant thoughts and feelings.

Disadvantages:

1) High personnel costs.
2) Poor standardization.
   Cases (patients) may be put in a difficult situation.

Student's feedback:

We received an overwhelming and encouraging response from students.93% students were in favour of bedside sessions in pharmacology teaching. Students felt that Bedside sessions helped them in following ways.
1) Orientation towards dosage formulations and trade names.

2) Better understanding of dose titration.

3) Limitations of drug use (Adverse effects).

4) Understanding of clinically relevant drug interactions.

Some of the topics which students suggested for bedside teaching were: COPD, IHD, epilepsy, depression/MDP/Schizophrenia, hypertension, MI, substance abuse, cancer, malaria.

Conclusion

As is clear from our results bedside teaching of pharmacology clearly enhances the overall grasp and understanding of the subject, which was translated into better performance in the test. The students positive feedback was also commensurate with

their performance. We, therefore propose to incorporate bedside teaching into our regular teaching curriculum.

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