Editorial

Implementation of Task-based and problem-based Pharmacotherapy Course for Pre-Clinical Medical Students

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Abstract:

Pharmacology, like other basic science disciplines, is still taught didactically in many medical schools. Increasing number of drugs, changes on general principles of mechanisms of drug action and more information on properties of drugs require innovative approaches to undergraduate education. Research in medical and pharmaceutical education is increasingly utilizing a variety of innovative teaching methods to ultimately improve retention of knowledge.

This paper describes implementation of new task-based and problem-based pharmacotherapy course for 3rd year pre-clinical medical students at Faculty of Medicine and Health Sciences, Omdurman Islamic University.

Key words: Pharmacotherapy, Task-based learning, P –drug

Pharmacology is different from most other biological sciences, because it does not ask how nature works, but rather how can we change nature? Answering this question requires integrated effort of multiple techniques (molecular, biochemical, cellular, and organ system-based) to come to a total understanding of the drug actions[1]. Pharmacology teaching to medical students differs from that to other science students, because medical students not only have to understand mechanisms of drug action, but must also memorize numerous detailed facts about drug classes and its individual components. Moreover, when basic pharmacology classes for medical students is taught before the students have learned much about the diseases for which the

various drugs are used, this makes understanding rather difficult. Given the central role of drug treatment in practice of medicine, these challenges must be resolved to train tomorrow's physician successfully[2].

Therapeutic options are rarely "right" or "wrong" but are open to interpretation, as dictated by the individual peculiarities of patients, i.e. every case should be taken on its own merits. Pharmaceutical care delivery requires the doctor to have a number of different attributes other than ability to recall factual knowledge. However innovative strategies are required to train medical students in an atmosphere of real practice or "real world"[3]. Current researches suggest that understanding a student learning styles is helpful in providing successful learning experience. The term "learning style" was defined by Cassidy as "the way in which individuals characteristically approach different tasks"[4]. Different methods are now

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used to investigate learning styles in order to accomplish the task. One of these learning style instruments is the Grasha Reichmann Student Learning Style Scale (GRSLSS). The outermost outcome of this model is to investigate the student's instructional preferences and how the student interacts in learning situation and how these interactive characteristics affect the learning preferences[5].

GRSLSS identifies six major individual styles[6]. The "independent" learner is described as the student who likes to think for himself/herself and prefer to work alone. The "avoidant" learner is uninterested, does not participate, and may be overwhelmed by the class activities. The "collaborative" learner is the student who enjoys sharing ideas and knowledge, and works well with other students and facilitators. The "dependent" learner is classified by Grasha as a student who works well when specific guidelines were established by authority figures and performs well duties that are required. The "competitive" learner performs as the term describes; competes and enjoys recognition of excelling companions. The "participant" learner is eager and takes part in as much of the course activity as possible.

Certain relationships have been identified between clusters of primary learning styles and teaching styles (table 1). Students who prefer a teaching style that utilizes Problem –based learning (PBL) fall into a cluster of learning styles that includes a triad of "collaborative", "participant", and "independent" characteristics.

Table (1): Learning styles and suitable teaching methods[6].

The Learning Style	The Suitable Teaching Method
Dependent	Teacher-centered in questioning and discussion Role modeling by direct example
Participant	Lectures, Case studies, Student JournalsRole modeling by illustration
Competitive	Exams and grades emphasized
Collaborative	Coaching, Problem-based learning, Self-discovery activities
Independent	Roundtable discussion, Panel discussion

Rationale:

In the Faculty of Medicine and Health Sciences, Omdurman Islamic University, the main style of teaching was lecture-based learning. But there is a call for change to innovative styles such as Problem-based and Task-based learning especially in Basic Medical Sciences such as pharmacology[7]. In this spirit we in the department of pharmacology together with the Deanship have proposed and developed a core content of pharmacotherapy course delivered in combination of problem-based and task-based learning to serve as a lever to the traditional lectures in order to utilize most of the student learning styles. The primary goal of the course was to limit traditional lectures and focus on student-centered discussion.

The impact of previous short course of pharmacotherapy on the final year students had been assessed objectively as positive to come with an advice that this course should

be taught earlier than the final year i.e. at the preclinical phase[8].

Methods:

The 3rd year preclinical medical students comprised of males (n=151) and females (n=148) have participated in a fortnight course respectively from the 1rst through 15th April 2008.

These students have almost completed a traditional pharmacology lecture courses throughout the pervious three years and were about to shift to the clinical stage. Each class of male and female was divided into 10 groups; each consists of about 15 students. Each group was provided with two ill-structured problems of different clinical cases (Table 2). Students have to select the best drug "(p)-drug" and write a rational prescription[8]. At the same time they have to solve the problem in a form of role-play and to present their task to the classmates and course coordinator. Two sessions of two different groups of male and female presented

daily. Each session was completed with in 20 minutes followed by 10 minutes time for discussion. Guest clinicians of relevant topics had been invited to comment on diagnosis and management of the case problem presented. Each group was evaluated on the quality content and presentation performance by the nine observing groups as peer assessment. To minimize the variability of subjective evaluation measures, specific evaluation sheet was developed for the course components and was distributed before each session to be collected by the end of the session. The coordinator translates the subjective impression into numerical grades to determine each group score. An evaluation questionnaire designed to collect data on students view points of the course was submitted by the end of the course. The evaluation sheet and questionnaire subsequently were used as self, peer and faculty evaluation tools.

Table (2) Showing the problem topics provided for each group

Groups (Male & Female)	Problem 1	Problem 2
Group 1	Asthma	Schizophrenia
Group 2	Hypertension	Rheumatoid Arthritis
Group 3	Congestive Heart Failure	Glaucoma
Group 4	Myocardial Infarction	Diabetes Type 2
Group 5	Angina	Malignancy pain
Group 6	Duodenal Ulcer	Thyrotoxicosis
Group 7	Depression	Anticoagulant therapy
Group 8	Epilepsy	Typhoid
Group 9	Tuberculosis	Malaria
Group 10	Diabetes Type 1	Pneumonia

Scoring and analysis:

The assessment sheet consisted of two parts. The first part to assess the group work on solving the problem, their methodology for selection of the (p)-drug and the prescription writing. It consists of 20 questions each with three close answers. The score of this part was 40 marks.

The second part was designed to assess

their task performance evaluating the behavior, communication and group facilitation skills. It consists of 12 questions each with three closed answers and open question on the overall impression of the session presented. This gives total score of 40 marks. Thus the total peer assessment was 80 marks. The remaining 20 marks were given by coordinator of the course for the group

attendance, group sharing and time management of session. The mean of scores of peer assessment given by nine groups for the two problems added to the coordinator assessment made the final scores [Fig 1&2].
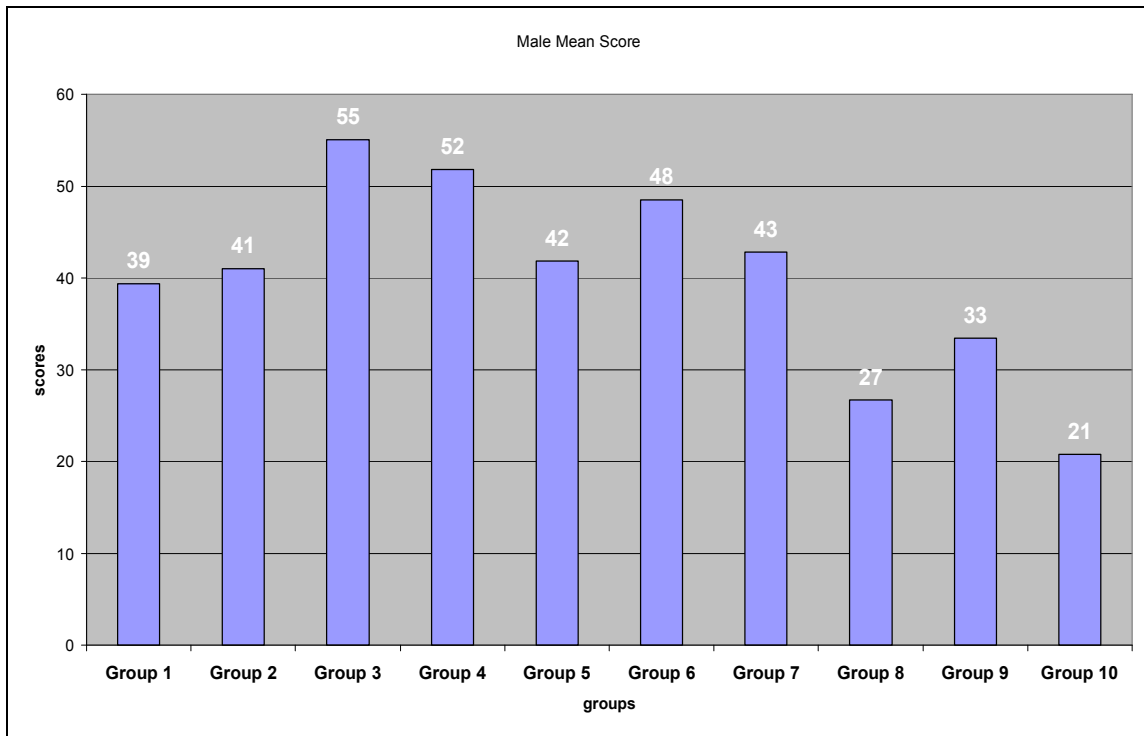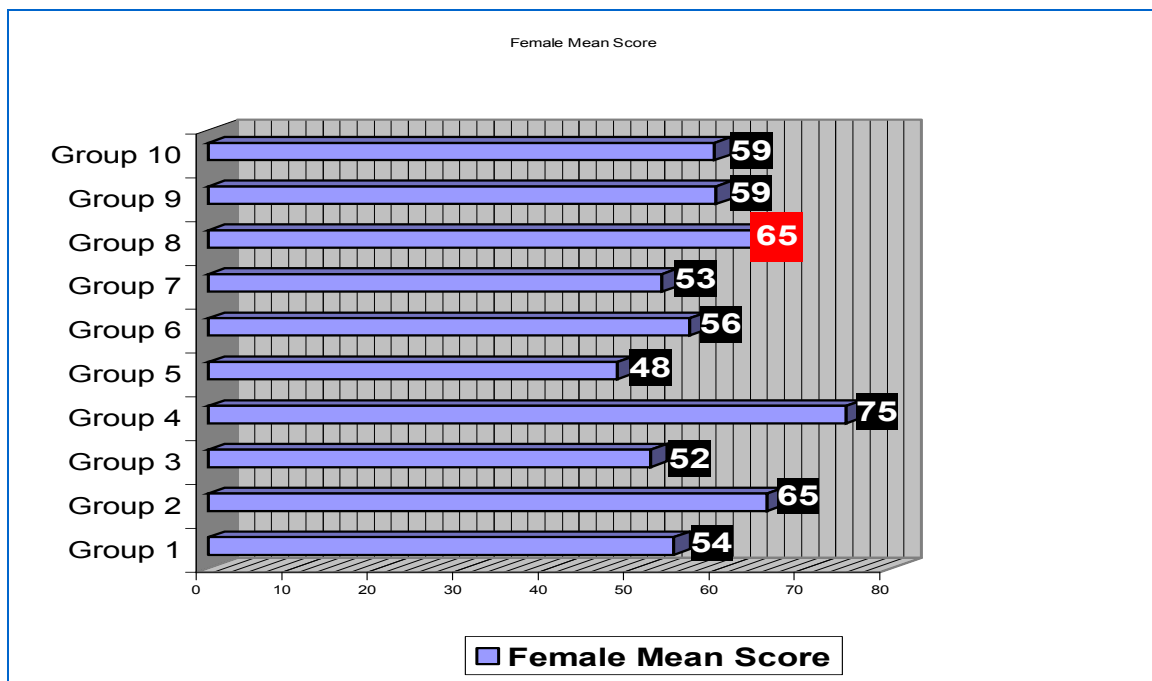

Figure (1) Male groups mean scores

Figure (2) Female groups mean scores

Discussion:

The results are based on assessment of therapeutic problems regarding 20 different diseases to 40 different tasks performed by male and female groups. The results showed that the application of pharmacological knowledge in therapeutic problems leads to significant increase of both therapeutic and diagnostic skills of the preclinical medical students according to the comments of the attending clinicians and course coordinator. Performing an act in an atmosphere simulating the real atmosphere of practice, with high competition in the communication skills to choose the relevant and suitable drug treatment for the particular problem data and determine the monitoring management resulted in super task presentations enthusiastic, creative, professional, funny, attractive and exciting gain in knowledge according to the Peer evaluation and the analysis of the evaluation questionnaire. Peer assessment (students evaluating other students' work) is a powerful technique which offers improvement of the educational judgments [9].

The course was highly appreciated by students, as indicated by different methods that students were encouraged towards active participation. Also, the course format increased their interest in pursuing additional studies in this area.

The post-course questionnaire results revealed the students satisfaction with the course and demonstrated that they have gained self-confidence to apply rational pharmacotherapy to communicate better with patients. Much more time for each case was needed. The students suggested that in coming courses one problem per day should be presented and discussed.

As overall assessment the task-based and problem-based pharmacotherapy learning was associated with highly generated motivation and enjoyment on the side of students which doesn't occur in classical forms of pharmacology teaching. We found that their interaction with the course was very impressive and surprising.

Conclusion:

We conclude that preclinical course of Task-based Problem–based pharmacotherapy is necessary at medical schools, to supplement and augment the basic and systemic pharmacotherapy education offered at present.

Some courses and/or clerkship of rational pharmacotherapy decision making should be added to curriculum and education should favor problem based methods with much enough time given for the students' interactions.

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