

Problem based learning (PBL) vs. Case based curriculum in clinical clerkship, Internal Medicine innovated Curriculum, Student prospective

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Abstract

Background. The vast majority of PBL experience is in basic science courses. Application of classic Problem based learning in clerkship phase is challenging. Although the clinical case is considered a problem, yet solving this problem following the burrow's law has faced hurdles. The difficulties are facing the learner, the teacher and curricula. We implement innovative curriculum for the clerkship year in internal medicine course.

Method. We surveyed the student just before coming to an internal medicine course to ask them about continuing PBL or other types of learning in clinical years. A committee was created to study the possible ways to integrate PBL in the course. After multiple brainstorming meeting, an innovated curriculum was implemented. Student surveyed again after they completed their course. The survey is asking them about what is the effect of the implemented curriculum in their skills, attitude, and knowledge.

Results. 70% of Students, who finished their basic science in PBL, preferred not to have classical PBL, but more a clinical oriented case based curriculum in the clinical years. After this innovated curriculum, 50 -60 % of students who completed it showed a positive response in all aspects of effects including skill, attitude, and knowledge. The Innovated curriculum includes daily morning report, 3 bedside teaching, investigation session, and clinical reasoning weekly, and Lectures up to twice a week.

Conclusion. We suggest implementing a curriculum with PBL and case-based criteria in clinical phase are feasible, we are providing a framework with this innovated curriculum.

Key words: problem-based learning, learning strategies, medical education, problem solving, critical thinking, problem-based curriculum, case based curriculum, case based learning and clinical phase.

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Introduction

At Qassim University medical school, we applied PBL curriculum in the first 3 years since the school was started, this is including basic science years and preclinical phase. We were able to conduct PBL curriculum, considering the local challenges and we were the first college to apply it in Saudi Arabia. We faced the hurdles of training our staff in a very dynamic and changing environment. We have been successful in applying the principle of PBL in the basic science years. The challenges we face more in the years after in the clinical phase. Our curriculum is 6 years of medical college where students get their basic science in the first two years, followed by pre clinical year and the final two years are pure clinical. The first challenge we faced in the clinical phase is training our physicians in the hospital to conduct PBL sessions in the hospital setting. Most of our staff is coming from abroad, mainly from Middle Eastern countries. Annually, 10% of them move in and out of the pool of staff for different reasons, which make the training part is more difficult. The second challenge in the clinical phase was trying to build a curriculum, which is suitable for different sets of our medical services in different hospitals. Internal medicine course is the longest with 16 weeks and utilize the whole semester. Radiology and dermatology courses are integrated in the same semester. We train our students in two main hospitals in the region; both of them have different capacity, catchment region. One of them considered as a general hospital and the other is a more specialized hospital where oncology, cardiology services, and advance surgery occurred. The scope of this paper is describing our innovated curriculum and getting our student prospective.

Method

We created a committee in the department of medicine to study the option available to apply PBL curriculum in the internal medicine course. After multiple brainstorming meetings, multiple visits to different medical schools applying PBL in its clinical phase, we come up with innovated curriculum considering PBL principles, our local environment and challenges.

Innovated curriculum

In a typical 5 working days, three days started with morning reports followed by bedside clinical teaching. The other two mornings devoted to self-learning time and other integrated courses. Two afternoons are for investigational sessions and lectures (two for each). Clinical reasoning session is once weekly (Table 1).

Morning reports

Students are encouraged to spend few hours in the ER as an observer. They will have a chance to observe routine ER patients with commonly presented complaints and the required steps in each emergency case from the moment the patient come to ER until the patient get dispatched either discharged or admitted. It gives students the chance of interacting with emergency staff, and patients. 1-2 students are required to prepare a case seen in ER to present these cases in the morning reports. A discussion is following student presentation to analyze the case from presenting complaints to the proper management. Our teaching staffs are mentoring this discussion and helping, guiding it going forward. All resources, mainly electronic, are available during these discussions. Students are encouraged to follow their patients after presenting their cases and give follow up reports few days afterwards.

Table 1. Innovated PBL curriculum in clinical phase

	Time	Day 1	Day 2	Day 3	Day 4	Day 5
AM	7:30-8:30	Morning Report	Self Studying time	Integrated other Clinical Courses	Morning Reports	Morning Reports
	9:00-12:00	Clinical Bedside Teaching			Clinical Bedside Teaching	Clinical Bedside Teaching
PM	1:00-3:00	Lecture	Investigational session	Investigational session	Clinical reasoning	Lecture

Bedside teaching

The classical bedside teaching, where staff performs a physical exam for a specific system and asking students to follow his steps. In our innovated curriculum, we encourage students to perform a physical exam and get peer's comments with complementary comments from our staff. We encourage our staff to make our students in the leading role in these sessions with their direct observation to provide help whenever is needed. The Student will have a chance to utilize Peer comments to improve their skills. Students are encouraged to prepare well for these bedside teachings by interviewing the patient ahead of time and taking his permission. Students are encouraged to visit different parts of the hospital, including laboratory facility, endoscopy suite, dialysis unit, and other parts of the hospital ancillary services.

Investigations sessions

Where students get exposed to different types of investigations encountered during the usual patient visit to outpatient and inpatient stay for frequent diseases. These sessions can discuss hematological, biochemical, Common electrolytes and mineral profiles. Also, they reviewed electrocardiography tracings and reports, echocardiography imaging and reports, Different radiological images, endoscopies reports, and bone scan reports. They discuss normal results or ranges and commonly encountered abnormal tracing, images, and reports.

These sessions give students a more chance to understand their patient holistically and be prepared for independent management of their patients.

Clinical reasoning session

These sessions represent a classroom discussion on a weekly base for commonly chronic disease long term managements including prevention and vaccines. One or two students prepare these cases from what they see in the hospital and they outline long term managements and dealing with possible complications based on the clinical data, professional judgment and knowledge. The student can choose these topics to answer their questions and inquires. These sessions attended by one of our staff to provide some guidance to help students to reach to the

appropriate management of the case discussed.

Self learning study time

Where the student utilizes this time to visit other parts of the hospital and prepare for their different sessions of the week.

Lectures

Classical lectures are allowed up to twice weekly of different topics prepared by our teaching staff. We encouraged our staff to make it an interactive session with two way learning and trying to avoid didactic lectures.

Students prospective

Part of our continuous evaluation of our curriculum we surveyed our students before they come to internal medicine and after they leave to get their prospective.

Pre clinical student questionnaire

We surveyed a sample of 57 students with 100% response. The sample was taken from one patch of student. The question outlines in table 1. These questions were formulated after brainstorming meetings of the two authors to address students' prospective of what they are likely wanting to see in their internal medicine course.

Post course questionnaire

A student who just finished the course gets another questionnaire to ask them about what they think about the course and its effects in their skills, attitude, and knowledge. We sampled 37 students with 100 % response.

Results

Pre clinical questionnaire (Table 2)

70 % of the students disagree to include a PBL session in the internal medicine course. Only 15 % agree to include it. When we asked the student about incorporating other mode of curriculum (case based, traditional, system based), the answer gets divided with 40% approved this choice and 45% disapproved it. Among the minority who recommend PBL in the clinical clerkship, 10 % recommend it weekly or monthly.

Post clinical questionnaire (Table 3)

57%, 65%, 60% of the students think PBL improved their skills, knowledge, and attitude respectively. Up to 15 % of the students think whatever they took in the internal medicine course it isn't PBL.

Table 2: Answers to the preclinical students' questionnaire (Total = 57 students), Each number represent one student.

No.	Point of inquiry	Strongly agree	Agree	I don't know	Disagree	Strongly disagree
1	Problem based learning (PBL) sessions should continue in the next 2 clinical years	5	4	7	1	40
2	Other mode of teaching (case based, traditional, system based) should be included	10	13	5	3	26
3	PBL Sessions should be weekly	4	2	6	4	41
4	PBL sessions should be bi weekly	1	2	7	6	41
5	PBL Sessions should be monthly	2	4	7	4	40
	Total	22	25	32	18	188

Table 3: Answers to the clinical phase students' questionnaire who completed internal medicine course (Total = 37), Each number represent one student.

No.	Point of inquiry	Strongly agree	Agree	I don't know	Disagree	Strongly disagree
1	I think PBL application in internal medicine course helped me to gain more skills	8	13	9	5	2
2	I think PBL Application in internal medicine course increased my knowledge	7	17	6	5	2
3	I think PBL application in internal medicine course changed my attitude positively	7	15	9	5	1
	Total	22	45	24	15	5

Discussion

Problem based learning is feasible in the clinical clerkship. Different format of such curriculum is required to match the local resources and challenges. In our innovated curriculum we tried to include all the principles of problem based learning to appropriately suit our clinical setting. ⁽¹⁻³⁾ Last decade, an educational change theory expert has proposed that educational change depends on what change means to those involved. ⁽⁴⁾ In other wards, no size fits all; application of learning module doesn't make it applicable in every environment. Previous experience in applying PBL in a clinical clerkship faced many challenges hinder its proper utilization.⁽⁵⁾ Considering educational change theory, nowadays students learn more about peer group and self learning tasks to gain their

knowledge. ⁽⁶⁾ Applying PBL in the clinical phase is helping them in this direction. Also, considering the changes in providing health services, which become more service oriented and less reward for teaching, making the PBL in clinical clerkship more needed. ⁽⁷⁾ We believed that students in the clinical years are willing to engage in a case based curriculum as its focus on the destination more than the journey itself. ⁽⁷⁾ Our curriculum we did consider both the process and solving the problem. Also, we considered the local resources and student, prospective in constructing our internal medicine curriculum.

Our curriculum has a variety of activities structured toward the principals of promoting self learning approach. All the activities constructed around a problem or a case seen or observed in a specific situation i.e.

emergency room (morning report), inpatient (bedside teaching), outpatient setting (clinical reasoning) and students will get the chance to review it before presenting it. The curriculum runs in themes to cover all the aspects of internal medicine. For instance, if one week, students learn cardiology exam, they will take cardiology investigations, lectures, and clinical reasoning session from cardiology too.

One of the criticisms of 'pure' model of PBL is not guiding learners sufficiently (a 'teach Yourself' curriculum); lacking focus, taking too much time and distracting students from gaining clinical skills, experience. ^(7, 8) Our curriculum is flexible in accommodating different students learning approach. ⁽⁹⁾ Every activity occurred once for maximum three times a week. We accommodate regular lectures and self-learning. Self learning time allocated in the morning where students can utilize it maximally. The way we are allocating our self learning slot to assure its proper use to foster reading and prevent any "time off" ideas which is potentially can occur sometimes.

The lecture is structured as a case based lecture. All the main concepts are presented as a case or problem, which stimulate discussion and consulting resources mainly electronic. Students have the privilege to choose the topic of the lectures if arrange appropriately ahead of time.

Tutor plays a central role in applying this curriculum. PBL tutor has been described as a facilitator rather than knowledge messenger. Therefore, we faced this challenge at the beginning of applying this curriculum. Medical education specialists through a series of workshops conducted training program of our staff. Our tutors are subject expertise too, although its effect is still debatable. ⁽¹⁰⁻¹⁴⁾ Our staff relatively stable over the last 5 years of implementation, which make training, is more valuable and productive.

In 2010 Jean McKendree ⁽¹⁵⁾ reviewed the PBL experience in the UK, one of the concerns of students was "not knowing where to stop" in exploring learning objectives'. In the department of medicine, we discuss this matter extensively, but we came up with the conclusion that we will offer a range of references, and students can choose. We noticed after a few years that students don't stick to one reference, but use different resources for different topics.

One of the central inquiries in applying PBL in the clinical clerkship is what are the differences between the PBL and case based curriculum. To answer the question we need to apply the definition of PBL and case based to our curriculum. We believe it is possible for any curriculum applied in a clinical setting to be both PBL and case based if it is satisfied the definition of both PBL ⁽¹⁾ and case base. ⁽⁷⁾ We think our curriculum fits in these criteria. The subtle difference is the idea of "Process" in PBL; while in case based "solving the problem" can come together in one curriculum, which apply, to ours.

In conclusion, we believe that applying PBL and case based curriculum is feasible and applicable whenever local resources and opportunities are aligned to create a curriculum matched the needs to translate the PBL and case base curriculum in the clinical clerkship.

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