

# The value of problem-based learning in teaching physiopathology

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## Abstract

Physiopathology is a complex medical science that requires knowledge of several medical fields. Its aim is to determine the origin, mechanism and explanation of the problem observed in the patient. This understanding of the physiopathological mechanism leads to specific therapeutic action which takes into account the process or processes incriminated in the occurrence of the problem for the patient.

This important and complex subject has been taught by Problem-Based Learning (PBL) in several countries.

We want to apply this concept to the faculty of Mostaganem, our objectives are to evaluate the impact of PBL on the understanding, reasoning and analysis of physiopathological mechanisms.

**Keywords:** Problem-Based Learning; Education Training; Initiation.

## 1. Introduction

Problem-based learning (PBL) is a teaching method that seeks to optimise the acquisition of knowledge, taking into account principles derived from the findings of cognitive psychology. It is a learning method in which learners first encounter a problem, and then continue the process of student-centred enquiry to understand and solve the problem.

One of the main aims of PBL is to encourage learners to take responsibility for their own learning, thereby developing a sense of initiative and transforming students into genuine health actors.

One of the essential elements of the PBL is group discussion: students in small groups are encouraged to construct and exchange ideas and to challenge each other's thoughts, beliefs and perceptions. The aim of physiopathology is to determine the origin and explanation of the problem observed in the patient, and this understanding of the physiopathological mechanism leads to specific therapeutic action which takes account of the process or processes incriminated in the occurrence of the problem for the patient. The teaching of physiopathology is described as complex and problematic, and in this study we applied the concept of PBL to the teaching of pathophysiology, cardiovascular and respiratory units, given to third-year students at the Faculty of Medicine in Mostaganem,

## 2. Methods

For some time now, the Mostaganem faculty has been planning to integrate PBL into preclinical teaching. This concept was already applied in 2016 in digestive semiology.

We have decided to apply Problem-based learning (PBL) to the teaching of physiopathology for the third year, starting with the first integrated unit, which focused on the cardiovascular and respiratory systems.

The class consisted of 112 students, whom we divided into 6 groups, Each group was divided into 4 or 5 sub-groups. 4 objectives were set at the end of the first session. Each session lasted 3 to 4 hours. The theme of the PBL was chosen on the basis of the most important pathophysiological questions encountered in the daily practice of doctors.

The topics covered were: hydration disorders, shock and acute respiratory distress. A single teacher was responsible for the various sessions. This choice was made both to enable the students to acquire the same approach to the problem and to give the teacher a better grasp of the PBL concept. Each theme required 6 to 7 hours of time.

## 3. Results

The questionnaire was structured along 5 axes with free comments, and the overall reliability was evaluated by Cronbach's test at 0.83. With regard to the first area and the approach to learning pathophysiology, the majority of students thought that this was an essential

prerequisite for understanding the clinic. They are also apprehensive about teaching it, and find it difficult to assimilate. The calculated trend for the axis was 4.24.

In question 6, more than 80% of the students said that the PBL had helped to clarify the concepts covered in the lecture; the calculated trend was 4.62, i.e. "agree, yes a lot" with this concept. 77% of the students thought that the PBL had enabled them to fill in their gaps in physiology,

With regard to group work, the PBL enabled its development for 43.5% of students and to a great extent for 35.3%, which corresponds to 78% of favourable responses.

Learning to work in a group and express oneself in public is a very important consequence of the PBL and represents an objective of university teaching; it was one of the main objectives to be evaluated during this study. All the students would like to have more PBL sessions and for this concept to be extended to other parts of the integrated units. In fact, in response to the question "I would need more different physiopathological situations in order to better master the concepts covered in my course". Our questionnaire did not cover these items, and these parameters should be evaluated during the next programme. This trend is clearly in favour of continuing to follow the PBL and recommending it to colleagues (4.59-4.9). Trullas et al. noted that 29% of the studies after reviewing the literature had carried out a satisfaction survey by questionnaire; 19 of the studies listed noted a positive effect on students, and 9 studies noted a rather neutral or negative effect. Overall, this study showed that PBL had a beneficial effect on acquisition of reasoning, understanding of the mechanism, medical lexicon and problem analysis. It also revealed that PBL initiates and improves students' presentation skills.

In Saudi Arabia, PBL has become an increasingly used mode of teaching, and an article published by Meo entitled "Evaluating learning among undergraduate medical students in schools with traditional and problem-based curricula", which assessed learning among undergraduate medical students, highlighted the fact that students who had benefited from PBL sessions had significantly higher knowledge and skills than those in traditional styles of medicine. What's more, PBL has a good impact on students, since a comparison between pre-PBL sessions and post-PBL sessions showed an overall improvement in performance. Sonia Soussi had shown that this method had favourable results for the development of critical thinking and clinical reasoning skills.

These results come from confronting students with a variety of care situations, thus developing their clinical judgement, which according to Nagels (2017) is triggered by comparing the state of development of clinical judgement at a given moment. Another reason why our students preferred the PBL was that it had become a space that allowed them to express their ideas and knowledge.

## 4. Conclusion

Problem-based learning (PBL) is a teaching concept that has been used around the world for several years. The introduction of problem-based learning in the 3rd year of Medicine at the Faculty of Mostaganem has clearly shown an improvement in our students' performance in terms of comprehension, clinical reasoning, communication, medical vocabulary, presentation skills and group work. The implementation of APP requires the involvement and training of tutors. This study has shown that there is a real and urgent need to introduce new teaching methods.

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