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RESEARCH ARTICLE

Problem-based Learning in Pediatric Dentistry: Perception of Students at the Mohamed VI Faculty of Dentistry

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ABSTRACT

Introduction: **Problem-based learning (PBL) is a teaching method that relies on the learner's active involvement in learning. It is a highly structured learning method with different stages, alternating group work and individual learning, enabling learners to learn clinical reasoning and acquire knowledge. The approach is guided by the teacher, who must support the construction of knowledge and create and supervise learning situations-a facilitating role. This work aims to assess learners' perception of its value as an active learning method used in pediatric dentistry.**

Methods: **This descriptive study was conducted within the Mohamed VI Faculty of Dentistry at the Mohamed VI University of Health Sciences in Casablanca (UM6SS) and concerned all 3rd year students for the 2021/2022 academic year. Students' perceptions of this teaching approach were assessed using a questionnaire administered at the end of the last ARP session.**

Results: **96.2% of students were interested in the PBL sessions, and 56.6% felt that the group work enabled them to acquire new knowledge. The proposed problem situation was clear and well assimilated for 52.8% of learners, provoking rich and interesting discussion for 88.7% of students and enabling the identification of appropriate objectives for 79.2% of learners.**

Conclusion: **The results of our study are promising and interesting in favor of developing and extending PBL teaching to other courses in pediatric dentistry. However, the various constraints inherent in this teaching modality must be considered.**

Keywords: Dental students, perception, problem-based learning, teaching.

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1. Introduction

Numerous innovations have been introduced in higher education, particularly in the medical sciences, with the aim of improving student training (Bousfiha *et al*., 2020).

These teaching methods, which have been constantly evolving over the last few decades, such as Problem-Based Learning (PBL), make extensive use of group work, thus reducing the emphasis on lecture-based teaching. The latter is teacher-centered and conducive to passive learning on the part of learners (Khemiss *et al*., 2022; Martin & Padula, 2018; Nadershahi *et al*., 2013).

The Faculty of Medicine at McMaster University in Hamilton, Ontario, Canada, was the first to exploit this original teaching when approach it was founded in 1970 (Lebrun, 1999; Savin-Baden, 2000). This method is in line with the currents of cognitive psychology and constructivism, whose principle is that the transfer of knowledge does not take place directly but requires the active participation of the learner (Fujikura *et al*., 2013).

PBL is therefore a pedagogical approach that relies on the learner's active involvement in the learning process. In this pedagogical formula, learning consists of an active process of constructing knowledge by interacting with one's environment and developing a reflection on real, meaningful interdisciplinary representations or situations that the learner may encounter in society rather than "simply" accumulating resources (Bousfiha *et al*., 2020; Giet *et al*., 2005; Nasr *et al*., 2004).

It is a highly structured, step-by-step learning method that alternates between group work and individual learning. Students work together to solve a problem for which they have received no prior specific training so as to learn the content and develop the skills set as objectives by the teacher(s) who chose or designed the problem. To solve the problem, students must draw on a variety of prior knowledge (integration, transfer). The aim is to explain the underlying phenomena by formulating hypotheses, verifying them through research (documentary or other), and synthesizing the information gathered. The approach is guided by the teacher, who must provide support for the construction of knowledge and create and supervise learning situations: he or she has a facilitating role (Bousfiha *et al*., 2020).

The Department of Pediatric Dentistry at the Mohamed VI Faculty of Dentistry of the Mohamed VI University of Science and Health (UM6SS) has been adopting active teaching methods of PBL since 2019 for a third-year module, "Dentino-pulpal therapeutics of temporary and immature permanent teeth."

The introduction of PBL has increased student motivation in preparing course activities, their interactions in the classroom and, above all, satisfactory results compared with courses previously taught using the traditional method.

With this in mind, we thought it would be interesting to extend this concept to other modules in pediatric dentistry courses, in particular the module on functional rehabilitation of the arches in children taught in the third year.

Student satisfaction is also closely linked to the quality of the training provided by a university. It is therefore linked to the quality of the various learning methods used. Improving the quality of learning requires the introduction of student-centered learning methods, a good student-teacher relationship and rigorous evaluation by teaching staff. For all these reasons, student satisfaction is a fundamental indicator of success (Bryant, 2006; Fujikura *et al*., 2013).

To assess students' perceptions of PBL in pediatric dentistry, we conducted a descriptive cross-sectional study.

2. Method

This is a descriptive cross-sectional study, which was carried out within the Mohamed VI Faculty of Dentistry at the Mohamed VI University of Health Sciences in Casablanca (UM6SS) and involved all 3rd year students for the 2021/2022 academic year. Students' perception of this teaching approach was assessed using a questionnaire administered at the end of the last APP session.

The questionnaire was a three-page printout comprising three main sections: student identification, student satisfaction with the PBL approach through ten questions, and a final section reserved for suggestions and proposals made by the students.

For the PBL activity we have set up, we have created a "Diagnosis and Therapeutics" PBL file on the theme of "restorative dentistry in children".

To plan our activity, we first defined the main parameters of our activity: the task required of the learners, the origin of the problem situation, the method of information gathering, the choice of information sources, the method of presentation of the problem situation and the presentation medium.

The learning session took place as follows:

- Learners are given a clinical vignette with a set of questions,
- They are invited to search for bibliographical references to answer questions,
- During the session, the clinical vignette is studied with the aim of progressively answering questions in a climate of discussion and collaboration between learners,
- In addition to his role as facilitator, the trainer clarifies and summarizes.

This APP activity was carried out using PowerPoint slides previously prepared by the teacher-tutor.

3. Results

We collected a total of 53 completed questionnaires, representing an 84% response rate. Table I presents a summary table of the collected data.

According to the results, the PBL sessions aroused interest in 96.2% of the students, and 56.6% felt that the group work enabled them to acquire new knowledge.

The proposed problem situation was clear and well assimilated for 52.8% of learners and provoked a rich and interesting discussion for 88.7% of students. It enabled the identification of appropriate objectives for 79.2% of learners, but for 47.2% of students, certain parts of the situation were ambiguous.

The individual preparation sessions devoted by students to preparing for the PBL session were less than 2 hours' work for 26.4%, between 2 h and 3 h for 45.3% and more than 3 h for 28.3% of the students questioned.

The bibliographical resources proposed by the tutors were deemed adequate by 61.5% of students, some of whom felt it necessary to have more references proposed by the tutors.

With regard to group work, 56.6% of students felt that the acquisition of knowledge was easy.

With a view to improving the PBL activity, some learners suggested:

- Reduce the number of students per group and divide up tutor tasks,
- Devote more time to PBL sessions, especially for discussion,
- Offer multidisciplinary PBL activity sessions.

Details of the results obtained are shown in Table I.

4. Discussion

Problem-based learning (PBL) is widely recognized as a pedagogical tool that enables high-level taxonomic learning and the acquisition of skills for resolving clinical situations of varying complexity as part of comprehensive patient care (Hagui *et al*., 2019). With this in mind, we have

TABLE I: Student Satisfaction with PBL Sessions

Variables	Absolutely N (%)	Partially N (%)	Not at all N (%)	Totally N (%)
Interest generated by ARP sessions	51 (96.2)	2 (3.8)	–	53 (100)
Group work and knowledge acquisition	30 (56.6)	22 (41.5)	1 (1.9)	53 (100)
Interesting and varied hypotheses	47 (88.7)	6 (11.3)	–	53 (100)
Identification of appropriate objectives	42 (79.2)	11 (20.8)	–	53 (100)
Appropriate bibliographical references	32 (61.5)	20 (38.5)	–	52 (100)

introduced this teaching method in pediatric dentistry at UM6SS University.

In the context of our study, analysis of the satisfaction questionnaires clearly underlines the interest aroused in the APP method by the learners exposed to it. Indeed, the majority of students are satisfied and have expressed their wish to extend this method to all courses in pediatric dentistry, and even to other disciplines. What is more, they acknowledged that the PBL method had enabled them to become more autonomous in their learning, and to develop more effective documentary research strategies. This approach has also enabled them to develop their reasoning and critical thinking skills, work as part of a team and thus improve their communication skills.

The study carried out by Bousfiha *et al.* (2020) showed that PBL sessions aroused the interest of 90.9% of students, who advocated the development of PBL teaching in pediatric dentistry.

Similarly, a study conducted by Girma Tadesse *et al.* (2022) that compared academic satisfaction with problem-based and lecture-based learning among health science students in Ethiopia, revealed that academic satisfaction among students exposed to PBL was higher (50.9%) compared to satisfaction among students who received traditional lecture-based instruction (49.9%).

Another study conducted by Ibrahim *et al.* (2018) at Bisha University, College of Medicine, Saudi Arabia highlighted that most students (86.3%) reported a positive perception on all items assessing the benefits of the PBL approach.

An evaluative study carried out by Hagui *et al.* (2019) for students in their 5th year of medical studies showed the positive impact of using PBL as a learning strategy aimed both at developing clinical reasoning in medical science learners and as a tool for assessing the acquisition of skills meeting specific educational objectives.

Similarly, a descriptive study conducted by Tribhuvan University (TU), Nepal, measuring students' perceptions of PBL and the role of tutors, showed that 85.5% of participants agreed that PBL is an interesting method of teaching and learning. They highly valued the tutor's role as facilitator and motivator of PBL sessions. (Yadav *et al.*, 2018).

5. Conclusion

Problem-based learning is a constructivist pedagogical method for learning and transferring knowledge to other contexts, in particular clinical placements.

The results of our study are promising and interesting, supporting the development and extension of PBL teaching to other courses in pediatric dentistry. However, we need to take into account the various constraints inherent in this teaching modality, such as the high volume of time devoted to this activity. It also requires more teaching staff, more equipment and documentation resources, and is therefore costlier in economic terms.

Conflict of Interest

The authors declare that they do not have any conflict of interest.

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