

Problem-Based Learning in Oral and Maxillofacial Surgery Education: The Shanghai Hybrid

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Purpose: A new hybrid course was designed for the practice of oral and maxillofacial surgery education, which included a problem-based learning (PBL) preclinical course and a 1-year clinical rotation under supervision. The aim of this study was to evaluate the effect of this hybrid course.

Materials and Methods: Eighty-seven students were included from 2006 to 2008. Of these students, 43 received PBL courses and 44 received traditional lecture-based courses. All the students took multiple-choice examinations before and after their clinical rotations. A self-assessment questionnaire was completed after completion of all preclinical courses. At the end of the 1-year clinical rotation, all students were asked to take the clinical skill test. We used *t* tests to assess the statistical significance of any changes in their scores.

Results: Students' scores on the multiple-choice examination showed significant improvement after taking both the PBL courses and the traditional lecture-based courses. The PBL group had better results regarding their overall scores than did the traditional group. The PBL group received higher scores in the "case analysis" and "operational skills" categories. The self-assessment showed that PBL students had more initiative to study in the library, a greater inclination toward teamwork, and more self-confidence before clinical practice.

Conclusions: PBL courses combined with supervised clinical rotation were shown to improve students' operative skill, enhance their ability to perform case analysis, and improve their self-confidence. However, to determine the long-term effect after graduation, further series of testing should be performed in these students over the next few years.

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Problem-based learning (PBL) was first established at McMaster University in Toronto, Ontario, Canada, in 1969.¹ It is an innovative educational strategy to enhance student-centered, interactive, and integrated learning through intensive small group tutorials. It has

been widely implemented in medical and dental schools. Many reports have shown that this method is effective and successful in helping students to improve their studying and clinical performance,²⁻⁶ but there are also studies that have shown that PBL has been less

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helpful in medical education. Until now, only a few reports on PBL practice in oral and maxillofacial surgery education have been published, so it is unclear whether PBL is fit for oral and maxillofacial surgery education.

On the basis of a PBL method, we designed a new hybrid course in oral and maxillofacial surgery education for fourth- and fifth-year dental school students, beginning in 2006. Students first took the PBL course, which was designed to teach them basic oral and maxillofacial surgical knowledge and operative skills, including dentoalveolar surgery, trauma, oral infection, tumor, and congenital deformity, at the fourth year. After taking the PBL courses, the students were enrolled in a 1-year clinical rotation under supervision. The aim of this study was to evaluate the effect of the new hybrid course by comparing it with the traditional teaching method.

Materials and Methods

From 2006 to 2008, 87 students were included in this study. They were divided into 2 groups.

Group 1 (n = 44) was taught by traditional lecture-based courses. Of these students, 37 came from mainland China, 5 from Chinese Taiwan, and 2 from the Republic of Korea. All students were fourth-year students of Shanghai Jiao Tong University School of Stomatology, Shanghai, China. They could speak both Chinese and English and were trained to use PubMed/MEDLINE for literature searches. The students were divided into 4 teams. Two teachers gave lectures on oral and maxillofacial surgery once a week for 1 year. The course contents contained 12 parts (including oral anatomy, physiology, pathology, dentoalveolar surgery, tooth extraction, tumor, trauma, and congenital deformity). Altogether, 24 hours were spent on the traditional lecture-based courses. All course content was printed as paper handouts and provided to the students.

Group 2 (n = 43) was taught with the hybrid course. Of these students, 38 came from mainland China, 3 from the Republic of Korea, and 2 from the United States. A PBL curriculum was designed by the

same 2 teachers who designed the lecture-based courses, so as to avoid deviation in teaching rigor (Fig 1). All the students were divided into 5 teams. The procedure for PBL is similar to that in previously reported studies. The same 24 hours were spent on PBL courses.

After the courses were completed, a questionnaire was provided to both groups of students to determine their subjective feelings about their learning experiences. On this questionnaire, a standard visual analog scale was used to evaluate "study interest," "helpfulness in studying dental alveolar surgery," "improvement in knowledge and clinical skill," "motivation for cooperating with classmates," and "confidence in clinic practice." The intensity of a student's answer was indicated by his or her selection of a number from 0 to 10, with 0 representing the lowest and 10 being the highest.

In the fifth year the students in both groups received a supervised 1-year clinical rotation. Multiple-choice examinations were conducted before the clinical rotation. The examination covered subject matter in anatomy, histology, pathology and microbiology, infection, dentoalveolar surgery, tumor, trauma, and congenital deformity. All the questions were selected randomly from the standard medical test database (Fig 1). After their 1-year clinical rotation, students received a similar multiple-choice examination.

Students also took part in a clinical skill test. For this test, clinical cases were specifically chosen to evaluate the students' clinical abilities. Each student was asked to manage a new patient, and 3 independent examiners, who were senior physicians of the Oral and Maxillofacial Surgery Department at Shanghai Ninth People's Hospital, Shanghai Jiao Tong University School of Medicine, would ask the students several questions regarding the diagnosis and treatment for the case. The group of senior physicians then evaluated the students' performance in 5 areas: medical history writing, physical examination, diagnosis, differential diagnosis, and treatment.

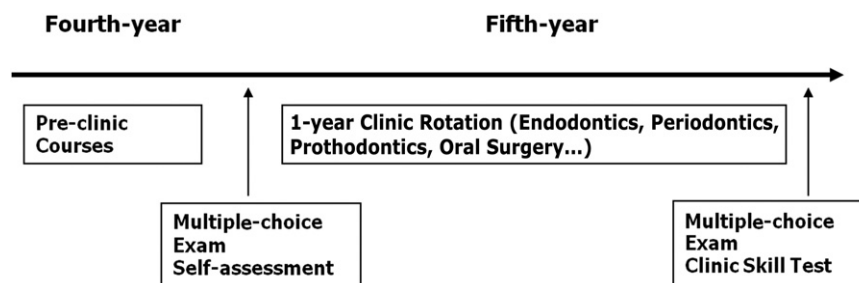


FIGURE 1. The learning process for the fourth and fifth year students.

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