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Peer Instruction: New Teaching Method in Otolaryngology

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Abstract

Introduction: Teaching medicine is not an easy task. Peer instruction is a teaching strategy in the promotion and understanding of concepts and problem-solving skills relative to traditional classes. Objective: to evaluate the active practice of teaching methodologies, in particular the peer instruction method which is applied to otolaryngology in the fourth year of medical school, at a Brazilian University? Methods: 28 undergraduates from the fourth year of medical school at a Brazilian university took part in teaching using peer instruction techniques, which were adapted to the otolaryngology scenario. After 8 weeks, the students filled out an evaluation form on the teaching technique used, and underwent a self-evaluation of the acquired knowledge. Results: Students reported that the peer instruction method helped them to better understand the concepts compared to the traditional method of teaching (82%). They also reported increased participation in class (96.4%), and they felt more motivated to interact with students during class (89.2%). 82% of students agreed that peer instruction facilitated learning with greater motivation. Conclusion: The results suggest that the use of peer instruction can bring benefits to the learning process in otolaryngology. One can also observe a greater motivation, class participation and cooperation amongst the students

Keywords: Undergraduate teaching; Peer Instruction; Otolaryngology

Introduction

It is known teaching medicine is not an easy task. Among the main faculty challenges, the lack of students' motivation for content learning stands out. This lack of motivation is mostly due to how education is currently done, more specifically, to the passive forms of information transmission which are still often used in classrooms. However, the same educational methodologies have been used for centuries, in spite results that are below the desired levels. The medical education model currently used in most Brazilian medical schools reinforces the guidelines of the Flexner Report, resulting in excessive centralization of high complexity teaching and in high technology hospitals.

Consequently, students often end up strongly associating medical subjects with the mere memorization of theoretical definitions without meaning and/or connection with their everyday life [1]. Thus, the implementation of different activities in formal educational environments that promote changes in students' attitudes is a challenging and necessary task. It is necessary to give opportunity to the educator to experience teaching activities with new methodological and technological trends, in order to evolve positively in a real educational setting. In the perception of Carvalho [2], pedagogical practice should be modified in order to boost the construction of knowledge and allow the inclusion of scientific knowledge from different methodologies. The creation of programs was recommended

internationally at the II World Medical Education Conference in 1998, in order to improve the teaching competency and the capacity of faculty communication. The focus is on ethics and the scientific approach, as well as ongoing medical education and long-lasting learning [3].

In the otolaryngology (ENT) area, few studies have been done relative to traditional teaching and possible changes [3,4]. There is a large discrepancy between the curricular content used for ENT problems in medical school and the importance of these issues for undergraduate students. In recent decades, the time assigned to the disciplines of specialties such as otolaryngology has decreased while the knowledge of diseases has grown exponentially [5]. Therefore, we should use the available time more efficiently [1].

It is necessary to include new educational technologies in line with different methodological proposals that provide better use of their potential and greater commitment from students to teaching moments. Some innovative teaching methods have been successfully used internationally to promote such commitment, in particular, peer instruction developed by Eric Mazur [5].

Peer instruction was proposed for higher education in the mid-1990s by Prof. Eric Mazur, at Harvard University. In recent years, the method has quickly spread around the world. It is currently being used by hundreds of teachers in 23 countries, with particular emphasis on its use in North American, Canadian and Australian universities [6].

Peer instruction is a teaching strategy focused on the promotion and understanding of concepts and skills relative to traditional classes. In otolaryngology, this teaching practice is still scarce [7]. Thus, the aim of this study is to evaluate the practice of active teaching methodologies, in particular the peer instruction method, as applied to otolaryngology in the fourth year of medical school at a Brazilian university.

Method

28 students from the fourth year of medical school had classes using the peer instruction technique adapted to an otolaryngology scenario. The addressed themes were the same as those used in traditional techniques and followed the pedagogical project of the University: 1) in order to demonstrate that the student can obtain a history of present illness related to otolaryngology, 2) to conduct a complete otolaryngology clinical exam and be able to get to the possible diagnosis, 3) to be able to differentiate between life-threatening diseases, serious and light conditions, 4) to recognize the need to refer to an otolaryngologist, 5) to be used to various types of tests and treatments used in otolaryngology.

The teaching and learning happened in an adaptation of the authors to the technique recommended by Eric Mazur [5] as follows:

a) In the first class in an eight-class cycle, the students received information on the operation of the course, on what the active methodology technique (peer instruction) is understood how their assessments would work, and that they were participating in a pedagogical evaluation study.

b) Five days prior to the first class, using forms from Google Docs®, the students received a medical case about a theme in otolaryngology, as well as a reference text that contained information on the case, and general open-ended questions (which are called concepts questions) on the clinical case (i.e., "What is the diagnosis hypothesis?"; "What are the additional tests needed to help confirm the diagnosis hypothesis?"; "What is the suggested treatment for this patient from the most probable diagnosis?"). The students had to answer these questions using the Internet within 24 hours before the first class.

c) One day prior to the class, the teacher collected the answers and assembled the aforementioned questions, this time offering multiple choice answers.

d) On the day of the class, students took materials that could be consulted such as tablets, laptops, cell phones and books. They were divided into groups of three or four.

e) The questions were first presented to individual students who responded through a form on the Internet (the teacher has access to the answers in real time). After the multiple choice questions, if more than 90% of the students answered the concept question correctly, the next question is given. If the percentage of accuracy is not satisfactory, students discuss the answer among them and consult the supporting materials as needed. The question is asked once again, but this time the answer is given by the students as a group. If the right answer is given, the next question is addressed, if not, the teacher explains the topic with the help of the students who correctly answered the question.

After 8 weeks, students filled out an evaluation form on the instruction technique and underwent a acquired knowledge self-assessment (Table 1).

Table 1: Self-assessment form on the instruction technique.

1	Did I learn more with the new teaching peer instruction method in contrast to traditional classes? (agree, indifferent, disagree)
2	Did I learn the content more easily with the new teaching peer instruction method? (agree, indifferent, disagree)
3	Did I feel more motivated to learn with the peer instruction method? (agree, indifferent, disagree)
4	Did peer instruction help me improve my performance on tests? (agree, indifferent, disagree)
5	Did peer instruction stimulated the interaction with peers during the discussion of our answers? (agree, indifferent, disagree)
6	Did peer instruction made me feel more involved in class? (agree, indifferent, disagree)
7	Did the peer instruction method help me pay more attention to class? (agree, indifferent, disagree)

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8	Did peer instruction let me comprehend concepts better? (agree, indifferent, disagree)
9	Did peer instruction help me get immediate feedback on what I knew and did not know? (agree, indifferent, disagree)
10	Did peer instruction increase my class participation? (agree, indifferent, disagree)
11	Would you recommend this new method for other subjects? (yes, perhaps, no)

Results

The participant teacher can attest to the satisfaction of almost all the students in the class when sharing his subjective perception of the development of activities. Satisfaction was evident in compliments stated by the students, who were delighted not only with the environment and the available resources to the practices, but also, and mainly, on the dynamics of the "Peer Instruction" method that guaranteed a dynamic and interactive way of learning. An indicator of student satisfaction with such interactive methodology can be seen in the answers to the questionnaire that evaluated the teaching method qualitatively. The sum of "agree" answers in the evaluation of the learning project was always superior to "indifferent" and "disagree" answers (Figure 1).

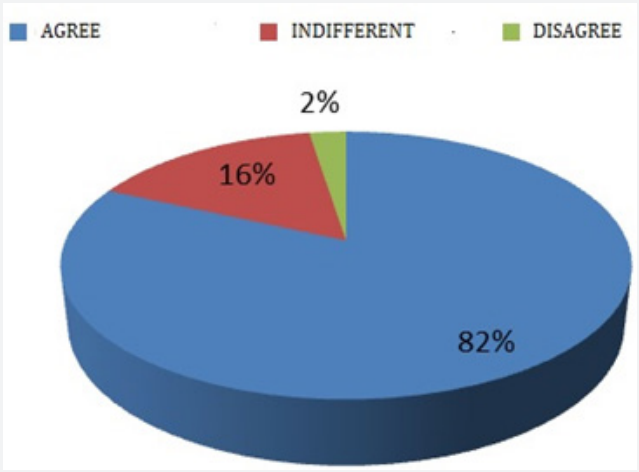

Figure 1: Peer Instruction general assessment.

The opinions of students were compared, and an overall similarity was observed regarding the applied teaching method (Table 2). 82% of students reported that the peer instruction method helped them to better understand the concepts compared to the traditional method. 96.4% of the students reported increased participation in classroom; 89.2% of them felt more stimulated to interact among the students during class. Thus, 82% concluded that there was greater motivation to learn. A minority of students expressed dissatisfaction with the new teaching method used (10.7%). Therefore, most students were satisfied with the applied methodology and would recommend it to be used for the other subjects in medical school (Table 3).

Table 2: Student's opinions regarding Peer Instruction.

Questions	Agree	Indifferent	Disagree
Did I learn more with the peer instruction method opposed to traditional classes?	23	4	1
Did I learn the content more easily with the new peer instruction teaching method?	24	3	1
Did I feel more motivated to learn with the peer instruction method?	23	4	1
Did peer instruction help me improve my performance on tests?	14	13	1
Did peer instruction stimulated the interaction with peers during the discussion of our answers?	25	3	0
Did peer instruction made me feel more involved in class?	26	2	0
Did the peer instruction method help me pay more attention to class?	27	1	0
Did the peer instruction method let me comprehend concepts better?	15	10	3
Did peer instruction help me get immediate feedback on what I knew and did not know?	25	3	0
Did the peer instruction method increase my class participation?	27	1	0

Table 3: Peer Instruction Recommendation.

Questions	Yes	Perhaps	No
Would you recommend this new method for other subjects?	24	3	1

Discussion

In this article, we show that students from the fourth year of medical school were motivated by the use of peer instruction as a teaching method. The use of the teaching technique has been associated with increased student performance and attention in the classroom, when assessed by the teacher. This can be explained because, according Berbel [1] the use of an active methodology can stimulate autonomous motivation in students, since they bring elements not thought of previously to class. This is the initial stimulus for the student to stop being a passive agent in the process of learning, and to act effectively in the construction of knowledge itself [7-9].

The peer instruction method is a teaching strategy that better promotes the understanding of concepts and problem-solving skills compared to traditional classes. Peer instruction can be understood as "instruction in pairs" or perhaps "instruction by peers".9 Schell, in 2013 warns that the definition "instruction in pairs" may give a false impression that students should necessarily work in pairs, which is not true because they form

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groups of students [10]. By using peer instruction, one seeks to diminish the focus on learning at the moment of "information transfer." Instead, the student seeks primary information right from its source, through reading, so that later, in an interactive classroom setting, he can discuss it with colleagues [10]. This method assumes that the teacher limits the initial exposure of a concept or content to not more than twenty minutes, and then gives a multiple-choice pretest to be answered individually (approximately two minutes in length). Students' responses can be reported to the teacher in various ways such as electronic response systems (clickers), colorful cards (flashcards), or through computers and other electronic devices connected to the Internet. If the frequency of correct answers is between 35% and 70%, students are encouraged to get into small groups, preferably with colleagues who have chosen different answers in the pretest, and discuss those difference for about three minutes, and then they finally vote again.11 The objective is that students reflect individually and later discuss their answers in groups before the teacher tells them which answer is correct. By stimulating greater interaction among students, according to this study, 89.2% of students felt more stimulated by the interaction during the peer instruction class. Peer instruction is already an accepted method in medical education; however, it is little used in otolaryngology [11]. In 2011, final-year students in the Department of Otolaryngology at the University Hospital in Dresden, underwent peer instruction learning techniques to learn about ENT clinical examinations. The 248 students were divided into 2 groups, the test group, which used the peer instruction method and the control group, which used traditional methods. They were trained and finally analyzed by their professors/ doctors in the standardized ENT clinical examinations. In addition, students evaluated the experience and the quality of the applied teaching method with a validated questionnaire. The evaluation results were consistently positive, with Kemper et al. [12] concluding that using a standardized clinical examination, regardless of the teaching method, students showed adequate results from their medical education without lowering the quality of teaching and examination [12]. After a significant amount of work to prepare the conceptual question, the professor was also able to update the content and rethink the quality of his workshops.

Conclusion

The results suggest that the use of peer instruction can bring benefits to the process of learning in otolaryngology. One can also observe greater motivation, better class participation and cooperation among students.

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