Comparison of Didactic Lectures and Open-Group Discussions in Surgical Teaching

Siripong Sirikurnpiboon MD*

** Department of Surgery, Rajavithi Hospital, College of Medicine, Rangsit University, Bangkok, Thailand*

Background and Objective: *The teaching of medicine has varied and has continued to develop until today. Most courses rely on the lecture although it may bring less benefit to students. Another teaching technique, the open group discussion, may not be the most effective, but is widely accepted as a teaching development especially for its overall improvement of student skills. Basically, the teaching of surgery has more limitations than other subjects because patients with critical conditions are required. The present study was designed to compare the effectiveness of these two teaching methods, the lecture and the open group discussion, in the Department of Surgery, Rajavithi Hospital.*

Material and Method: *Fifth year medical students enrolled from 2554-2555 BE (AD 2011-2012) were recruited in the study and randomly divided in groups by the Office of Administration, College of Medicine, Rangsit University. A colorectal surgeon taught the subject, common anorectal disease, throughout the study year. The drawing method was used to randomize the members grouped by teaching methods. The assessment comprised multiple choice questions (MCQ) and multiple essay questions (MEQ).*

Results: *Seventy-three students (39 females, 34 males) were recruited. Students' basic characteristic showed no association between groups of teaching methods. Higher mean MEQ scores were found in the open discussion group (55.83%) compared with those taught by lecture (31.23%), exhibiting significant difference ($p<0.001$). With respect to MCQ1 and MCQ 4, students in the open discussion group had higher scores than those in the lecture group), was also with statistical significance ($p = 0.02$).*

Conclusion: *Teaching medicine differs from other disciplines. To achieve the most effective teaching performance, teaching methods may be limited in some subjects. This study was a partial project for teaching in the Department of Surgery. It was shown that students in the open discussion group had better MCQ and MEQ scores than those in the lecture group. In developing student skills, giving open discussion provided greater interaction between instructors and students. Importantly, the instructor should manage and facilitate questioning techniques to more effectively transfer course content.*

Keywords: *Surgery, Teaching, Randomize*

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Nowadays, some objections have been raised regarding the use of direct teaching methods, such as lectures, in training undergraduate surgery students[1]. Current trends in the development of teaching and learning systems tend to favor techniques involving more participation and discussion between learners and instructors[2]. However, in the field of surgical instruction many limitations exist to this approach because most cases involve patients in critical or emergency situations, creating difficulties in designing teaching systems for demonstration teaching or bedside teaching. In the present study, the author compared ithe lecture method with the opengroup discussion in a problem-based learning context.

Correspondence to:
Sirikurnpiboon S, Department of Surgery, Rajavithi Hospital, 2 Phayathai Road, Ratchathewi, Bangkok 10400, Thailand.
Phone: 0-2354-8108 ext. 3140
E-mail: laizan99@hotmail.com

Material and Method

The aim of the present study was to compare the results of lecture and open group discussion instruction using problem-based learning on the topic, common anorectal disease, as part of general surgery training.

The study sample comprised fifth year medical students, registered for general surgery 2011-2012 were selected. The exclusion criteria included students who: (1) had abnormal psychological status; (2) were unable to complete the course and (3) did not have the right to take the final examination after course completion.

The students were assigned randomly into eight groups by the Administration Office of the Medical College, with 12-15 students in each group. The single instructor throughout the entire study year was a colorectal surgeon. Evaluation of each group was made at the end of the course by an examination consisting of 60 multiple-choice questions (MCQ) and

a modified essay question (MEQ). The examination was based on standard knowledge in line with the criteria of the Medical Council of Thailand. The subject matter of the examination was based on Schwartz' Principles of Surgery and Sabiston's Textbook of Surgery. Both examinations were created by another colorectal surgeon not involved in the course.

In the MCQ exam, the author chose to relate 5 from 60 items to the topic, common anorectal disease. The first question related to acute anal fissure management, in the case where painful anal bleeding was presented, and additional information was supplied in the form of a picture illustrating acute anal fissure. The second item concerned hemorrhoid pathogenesis, involving bleeding per rectum, and additional information was supplied in the form of a proctoscope image of a hemorrhoid. The third question related to perianal abscess management, and the details given were pain in the anus for two days. Supplementary information was given in the form of a picture showing redness and induration with a diameter of around 2 cm over the perianal area. The fourth item concerned fistula-in-ano evaluation. The diagnosis was off-and-on discharge from an incision and drainage wound of the perianal abscess for three months, and additional information was given from an anal examination reporting an external opening at the 1 o'clock position and dimple at the posterior midline at the dentate line level. The fifth item was related to bleeding hemorrhoid management, and the scenario was bleeding per rectum. Further information showed a proctoscope image of a bleeding hemorrhoid. The examination was created by the Administration Office of the Surgery Department with these five questions randomly sequenced within the other 55 items on general surgery.

The MEQ test was checked after the examination by the author with reference to the criteria of standard knowledge of the Medical council of Thailand, and the author randomly selected one student from each group to take the MEQ examination in common anorectal disease.

Statistical analysis techniques used were the non-parametric Mann-Whitney U test and student t-test for metric scores; data analysis was performed using SPSS 17 software.

The present study was approved by the Rajavithi Hospital Ethics Board Committee.

Results

The medical student in this study were 73 persons, the male students were 34 and female students were 39. In MCQ test had 60 item.The mean MCQ score were 75.63±5.41 in lecture group and 82.33±4.89 in open discussion group.

The examination results showed that the lecture group scored 60.5%, 94.7%, 84.2%, 76.3%, 81.6% and 79.47% in MCQ1, MCQ2, MCQ3, MCQ4, MCQ5 and total MCQ, respectively. The mean score from the MEQ test was 31.23±10.7 (range 20-50%).

The open discussion group scored 91.4%, 100%, 77.1%, 100%, 88.6% and 91.43% in MCQ1, MCQ2, MCQ3, MCQ4, MCQ5 and total MCQ, respectively. The mean score of the MEQ examination was 55.83±8.11 (range 46-76%). Table 1 shows the results of the two groups. Comparison mean MCQ score and mean MEQ score between both groups are shown in Fig. 1,

Table 1. Comparison between teaching groups

	Open-group discussion n = 35	Lecture n = 38	*p*-value
Sex			0.730
Male	17 (48.6%)	17 (44.7%)	
Female	18 (51.4%)	21 (55.3%)	
College admission route			0.963
State examination	14 (40%)	15 (39.5%)	
College examination	21 (60%)	23 (61.5%)	
GPA mean ± SD (min-max)	2.65±0.41 (1.66-3.44)	2.67±0.46 (1.93-3.82)	0.890
MEQ score, mean ± SD (min-max)	55.83±8.11 (46-76)	31.23±10.7 (20-50)	<0.001*
MCQ1, n (%)	32 (91.40)	23 (60.5)	0.002*
MCQ2, n (%)	35 (100)	36 (94.7)	0.494
MCQ3, n (%)	27 (77.1)	32 (84.2)	0.444
MCQ4, n (%)	35 (100)	29 (76.3)	0.002*
MCQ5, n (%)	31 (88.6)	31 (81.6)	0.404
Total MCQ n (%)	160 (91.43)	151 (79.47)	0.02*

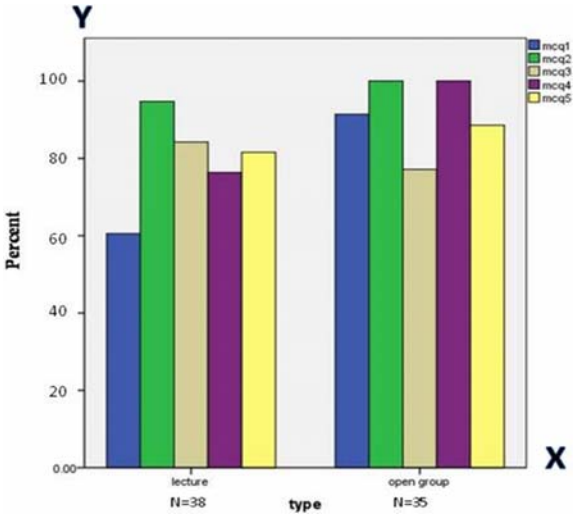

Fig. 1 Comparison of MCQ scores between groups.

respectively.

Discussion

Medical educators continue to look for better instructinal techniques, such as evidence-based teaching[3], to transfer knowledge effectively to medical students in a way that will facilitate their applying it effectively in practice. In choosing methods for transferring knowledge, many factors come into play, for example, ward round teaching is a good way to transfer knowledge at the same time as giving patient care, but the effectiveness of this relies on real-time patient status in the ward[4]. In surgery, therefore, practical limitations exist to "real-time" teaching, and that is one reason we need to find other ways to transfer knowledge using the limited resources available.

In the present study the author compared lecture and open discussion group techniques, and the results showed that the lecture group had lower scores than the open-discussion group in both MCQ and MEQ tests, and the results were statistically significant.

One of the limitations of MCQ tests is their validity, because students can sometimes just guess the right answer by chance without any knowledge of the subject matter[5]; furthermore, the cueing effect[6] can lead to wrong decisions. With regard to MEQ tests, this reopresents a step up the ladder in evaluation, but it still has limitations insofar as the examinees receive no feedback about their ideas[5]; furthermore, MEQ tests take much time both to create and evaluate. On the other hand, both tests do yield results in a numerical format. During the teaching course, the author assigned a single colorectal surgeon to teach throughout a full study year to avoid a "low structure"[7] situation because a content expert is able to facilitate thinking by controlling the content in class. Lectures are suitable methods of transferring knowledge to large groups of students for four reasons: (1) they are simple and economical for colleges to organize; (2) they are efficient and economical to prepare; (3) topics are created easily and (4) students can easily understand the content and achieve the objectives of the lesson[8]. The advantages of open group discussion over lectures are that it involves: (1) active participation; (2) purposeful activity and (3) face-to-face contact[9]. The study of this technique by Nandi et al[10] reported the results of a questionnaire from students and teachers: 75% of the students had more interest in preparing study before class, and 72% of non-volunteer teachers were satisfied after class. Regarding the level of success in achieving objectives, Donner et al[11] found that 90% of students who underwent two-way training were selected for specialized training while 71% of students who had had lecture training were chosen. However, the open group discussion technique had the drawback that it required more resources than the lecture method. Albanese et al[12] showed that two-way communication teaching required 14.8 hours/subject/year, while lecture teaching required only 4.8 hours/subject/year. Steele et al[13] reported no difference between faculty-led teaching and student-led teaching under the supervision of specialists. The goal of medical education is to achieve improvement in professional practices and health outcomes[14], and the present study showed that active participation achieved better results numerically; however, because of limited resources, the lecture technique is difficult to avoid. Suggestions to help to overcome this problem include a simulator, or simulated situations, which may be thought-provoking and stimulating during instruction[15] or the creation of buzz groups[16] during class to enable more discussion and participation.

Conclusion

The present study is one of many about medical education showing the immediate results after objective evaluation. In our study, the open group discussion technique provided a better chance for the students to take the knowledge gained and apply it at a highly appropriate level. However, this method is just one of many options available to assist medical students in gaining and applying knowledge in practice to improve patient care.

Potential conflicts of interest

None.

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การศึกษาเปรียบเทียบการสอนวิชาศัลยศาสตร์ระหว่างการสอนโดยการบรรยายและ open group discussion

สิริพงศ์ สิริกุลพิบูลย์

ภูมิหลังและวัตถุประสงค์: การเรียนการสอนทางแพทยศาสตร์ นั้นมีการพัฒนาอย่างต่อเนื่องมาโดยตลอดและเป็นที่ยอมรับโดยทั่วไปว่าการเรียนการสอนโดยการบรรยายนั้นเป็นการเรียนการสอนที่ให้ผลดีต่อผู้เรียนน้อยที่สุด แต่ปัจจุบันก็ยังจัดให้มีการเรียนการสอนโดยการบรรยาย อย่างไรก็ตามในการสอนลักษณะ open group discussion นั้นแม้ไม่ดีที่สุดในระบบการเรียนการสอนแต่ก็เป็นที่ยอมรับว่าเป็นการเรียนการสอนที่พัฒนาทักษะของผู้เรียนให้เพิ่มมากขึ้นได้ อย่างไรก็ตามในการเรียนการสอนทางศัลยศาสตร์นั้นมีข้อจำกัดมากกว่าภาควิชาอื่น เนื่องจากผู้ป่วยส่วนใหญ่นั้นเป็นผู้ป่วยที่อยู่ในสภาวะวิกฤต การสอนแสดงด้วยวิธีการอื่นจึงจำกัดการศึกษานี้ เพื่อเปรียบเทียบการสอนทั้งสองชนิดนี้ในภาควิชาศัลยศาสตร์

วัสดุและวิธีการ: ทำการศึกษาในนักศึกษาแพทย์ชั้นปีที่ 5 ปีการศึกษา พ.ศ. 2554-2555 (ค.ศ. 2011-2012) โดยนักศึกษาถูกแบ่งออกเป็นกลุ่ม A-H โดยการสุ่มอย่างอิสระโดยเจ้าหน้าที่ในสำนักงานธุรการ การสอนเลือกในส่วนหัวข้อ common anorectal disease และดำเนินการสอนโดยศัลยแพทย์ลำไส้ใหญ่-ทวารหนักหนึ่งคนตลอดปีการศึกษา การเลือกชนิดการสอนดำเนินโดยการจับสลากก่อนเริ่มการเรียนการสอน การประเมินการสัมฤทธิ์ผลของการสอนกระทำโดยการสอบ MCQ 60 ข้อ โดย 5 ข้อ จะเป็นเรื่อง common anorectal ที่เหมือนกันในทุกกลุ่มและสุ่มเลือก 2 กลุ่ม จากทั้งหมดประเมินโดยการสอบ MEQ โดยมีเนื้อหาหลักเป็นเรื่องเดียวกัน

ผลการศึกษา: นักศึกษาทั้งหมด 73 ราย แบ่งเป็นเพศชาย 34 ราย หญิง 39 ราย จากการศึกษาพบว่าเมื่อทดสอบด้วยการทำข้อสอบ MCQ จำนวน 5 ข้อ มี 2 ข้อที่มีความแตกต่างกันระหว่างสองกลุ่มและเมื่อทดสอบโดยการสอบ MEQ พบว่ากลุ่มตัวอย่างจากทั้งสองกลุ่มนั้นมีความแตกต่างกันในคะแนนที่สามารถทำได้อย่างมีนัยสำคัญทางสถิติ ($p<0.001$)

สรุป: การเรียนการสอนทางการแพทย์นั้นมีความแตกต่างจากสาขาวิชาอื่น การเรียนการสอนเพื่อให้เกิดประสิทธิภาพนั้นอาจมีข้อจำกัดอยู่บ้างในบางสาขาวิชา จากการศึกษานี้เป็นเพียงบางส่วนของวิชาศัลยศาสตร์ซึ่งสามารถแสดงได้ว่า การเรียนการสอนโดยการเปิดโอกาสให้นักศึกษาแสดงความคิดเห็นร่วมไปกับผู้สอนนั้นให้ประโยชน์มากกว่าการรับความรู้จากผู้สอนผ่านการบรรยายอย่างเห็นได้ชัดเจน