

Small Group Teaching in Epidemiology Courses

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Abstract

Background and purpose: small group teaching (SGT) is a known method for developing intellectual skills, changing attitudes and encouraging the taking of responsibilities for learning. This study was an attempt to compare students' attitudes and knowledge scores on SGT and lecture-based teaching (LBT).

Methods: 22 first year medical students were enrolled in a course using two methods (lecture-based and small group discussion) for teaching basic epidemiology. Data about attitudes and knowledge scores of the two methods were collected at the end of the course and analyzed using a two-sided Wilcoxon test.

Results: The students were satisfied and preferred SGT in terms of Evaluation method for the course, Participatory learning and team working, effectiveness and developing self learning skills ($p < 0.001$), and scored higher on topics of SGT ($p < 0.01$), but believed that they needed longer discussion of the topics.

Conclusion: Better question design and course organization and creating a safe, comfortable environment is essential for good performance. Integrating this teaching strategy in medical education curricula with appropriate professional and organizational development is suggested.

Key words: MEDICAL EDUCATION, SMALL GROUP TEACHING, COURSE EVALUATION

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Introduction

The society's need for different medical services on one hand, and ongoing progress in medicine, a trend for more specialty orientation of service and education and the development of new diagnostic and therapeutic methods and procedures, on the other hand have greatly challenged medical education (1,2,3,4). In line with these needs and developments, medical schools should make an effort to educate knowledgeable and efficient physicians (2,5). To accomplish this, every school has managed to

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modify its pedagogical programs in proportion to its facilities and capabilities (5,6,7,8). Yasuj medical school is one of the youngest colleges in the country which has been training medical students for less than 10 years. Although the college experiences various problems in the infrastructures of medical education, it keeps quite abreast of the present challenges in the field and is trying to promote the education of medical students drawing on other colleges' experiences and its own technical and scientific capabilities. This paper presents one of these endeavors in the field of teaching methods.

Defining small group teaching (SGT) on the basis of the number of the group members is in fact disregarding the teaching and learning process that occurs in the groups (9). SGT is a very active learning process in which participants manage

to enlighten their thoughts by expressing them. Of course many tutors consider management of a small group as a formidable assignment (10). There are three outstanding features to a successful group (9,10):

- Active participation of the group members: Interaction among group members can enhance the member's learning from each other.

- Clarification of tasks: Specification of the group objectives and the tasks that the members should perform can guarantee the success of the group.

- Reflection: Learning from some experience and the behavioral change appropriate to that experience is quite important. Deep learning is the basic realization of SGT success and reflection is the key to deep learning.

In addition to these features, provision of a positive and warm environment for the group members, regular attendance along with preparation, and encouragement of the students for sharing one another's notes and assignments (since group learning is a cooperative rather than competitive process) seems to be essential for group success (9,10).

Many advantages have been mentioned for learning in small groups: active learning, stimulation of individual incentives, application and development of ideas and improvement of deep learning, expansion of transferable skills like leadership, group work, organization, giving priority to tasks and performing them, problem solving, time management, and monitoring work environment (9).

There are some problems in this learning strategy, however. For example, one can refer to the lack of interest on the part of participants in work in small groups, lack of familiarity of faculty members with work in small groups, small numbers of faculty members, and the last not the least, insufficient facilities and equipment (10). Various methods have been proposed for SGT: Tutorial, seminar, snowballing, free discussion, problem-based learning, brain storming, role playing, games and patterns, clinical teaching (9,10). Each of these approaches has its own means and features and it is important to take the necessary measures before, during and after class discussion.

Clinical teaching is the oldest and most prevalent teaching method which used small groups. Another recent method of SGT of much interest to teachers is problem based learning which has been used at different levels and in different medical courses. Researchers have enumerated advantages and disadvantages for each of these strategies; however, in the courses like epidemiology and those in which the main objective is enhancement of knowledge, SGT has been used much less. This paper aims at presenting the results of the application of SGT to the course of Basics of Epidemiology.

Methods

This study was carried out during the second term of the academic year 2004-6 at Yasuj Medical School. Twenty two freshmen medical students (15 females and 8 males) were included in the study. Course contents were divided into two parts, 5 topics for lecture based teaching (LBT) and 11 topics for SGT. The first session was devoted to an elaborate explanation about the features of SGT, group dynamic, characteristics of a favorite small group, role division in the groups, course objectives, expectations from the group members, introduction of the topics, course references and other related points. Then the students were assigned to some groups of 4-5 members. They were also asked to attend classes with sufficient preparation for class discussions.

At the beginning of each session, every group was allotted a total of 45 minutes for renewed study and discussion of the topic in question. Having prepared a brief report of the discussion, each group would find a chance of presenting the topic to the other groups and answering the questions that the tutor or other groups would put to them. Each member's role was already clearly defined and they took turns performing their parts. The tutor was there to answer the difficult questions that might have been raised inside each group while supervising the activities and the quality of participation of each group member. Having listened to the reports, she would clarify any ambiguities involved and

explain any important point left unnoticed by the group members. Then she would conclude the discussion with supplementary explanations and examples if needed.

The final score for the course was assigned to final exam, active participation of each student in his or her group, and performance of an appropriate group work by the groups.

A test including short answer questions, blank space and matching items was used to assess the students' knowledge at the end of the course. In addition, a questionnaire was handed out to the students to collect their view points on SGT and LBT.

This 17-item questionnaire was already tested for reliability and validity. Such variables as satisfaction (2 items), cooperative learning and group work (5 items), effectiveness (3 items), course organization (4 items), and the assessment method (2 items) were derived to compare the

two educational strategies, SGT and LBT. There also appeared two open ended items calling for the students' comments on their likes and dislikes of these two methods. The data were then analyzed using paired T-test and Wilcoxon test by SPSS software.

Results

Table one shows the assessment factors and the related questions. Figure 1 indicates the results of the students' evaluations and comparison between the two methods. Except for the course organization which shows no significant difference between the two methods in all other aspects, the students preferred SGT to lecturing ($p < 0.05$).

Figure 2 depicts the comparison of average scores of the final exam on the presented topics via the two teaching methods.

Table: Questions used for evaluating teaching method

Satisfaction Satisfaction with the method Do you like to have other courses in this method?
Effectiveness Attainment of course objectives Capability of the method for explanation and transfer of the basic concepts Impact of the method on learning
participatory learning and group work Creation of motivation and willingness among students for participation in group discussions Degree of interaction among and between the students and the tutor Provision of a warm intimate environment for participation of all student How much are suggestion, criticisms, questions and answers welcomed? The students attempt and struggle for learning through this method
evaluation method appropriate assessment of the learner's achievement supervision on individual and group work and appropriate feedback in this method
course organization Presentation of syllabus and course objectives at the beginning of the course Planning and presenting material in this method Observance of educational regulations (calling role, class time, course content,...) Use of new resources and up-to-date material in this method Use of teaching aids appropriate to the course

Figure 1: Comparing students' attitude Mean scores on SGT&LBT

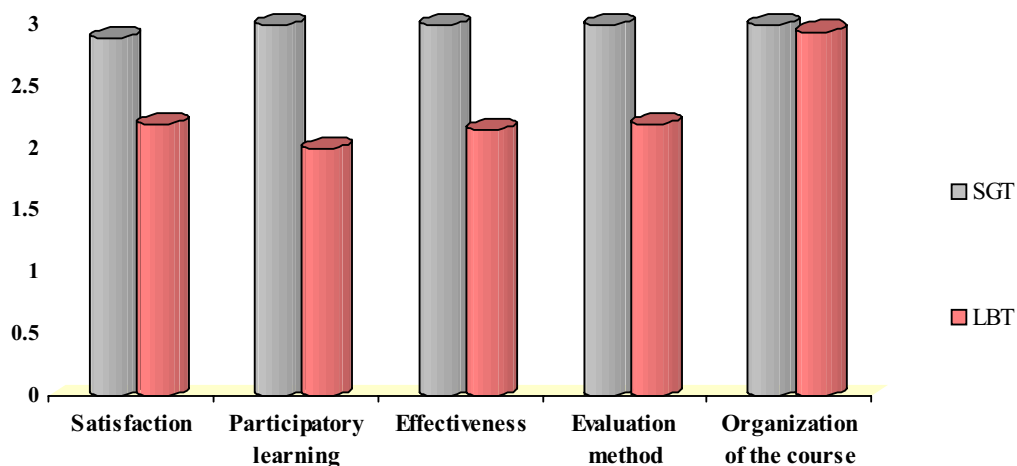
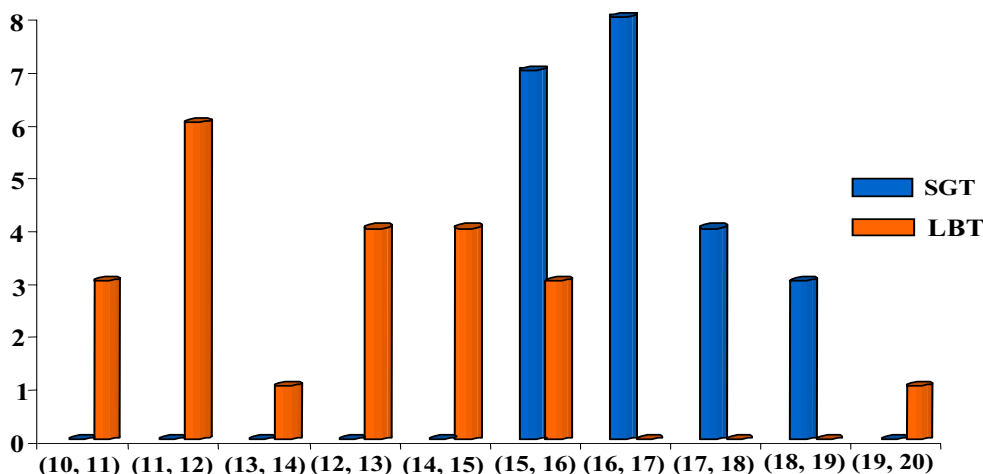


Figure 2: Comparing students' knowledge scores on SGT&LBT



Discussion

A brief look at the results clearly revealed that the students appreciated SGT to be better and more effective than the traditional method of lecturing. They also achieved higher scores on the SGT topics in the final exam. While a large number of the students preferred SGT to lecturing, nonetheless, they didn't favor speaking and presenting the final reports or answering the questions in the presence of their classmates. They asserted that they attended classes with

the fear of being chosen to report the materials. The male subjects preferred whole female or whole male groups to mixed groups. These complaints are in fact due to their weak communicative skills which are likely to affect their future career adversely (11). It follows that reinforcement of interpersonal and communicative skills should be taken into consideration, too. Of all the methods of SGT, problem based learning (PBL) appears to be of much more importance and effectiveness in medical education (12,13,14,15).

PBL is used in clinical education mostly with the aim of strengthening the problem solving and decision making skills (9). However, it is interesting to point out that there are few experiences of employing SGT in theoretical courses and especially in the basic sciences courses in which students have more difficulty learning and remembering items (3,13,15). But these few experiences and our results revealed that SGT appeared to be much more effective than other methods and also enhanced the students' interest in the related topics. It is likely that SGT, as we used it, will not be the best method for teaching all basic sciences, yet, our experience somehow emphasizes on the use of teaching methods other than lecturing for these courses.

with the extra work they had to undertake. They also complained about the shortage of reference books and reading aids and the lack of physical space for holding suitable group discussions.

This teaching methodology if accompanied by a previously designed lesson plan and proportionate session time and performed in appropriate physical place with the help of sufficient equipment, can be recommended as an effective method to be used in undergraduate medical education [16]. Special attention should be given to the problems of PBL, however, Teachers are in need of sophisticated organization, provision of appropriate questions for class discussions, and search for relevant scientific resources, something which might not be practicable in most of the present colleges.

To summarize, training future physicians should be different from that of the past. Not only should it help in satisfying their future professional needs, but it should also account for their needs in other areas such as team work and interpersonal and communicative skills. To accomplish this importance, use of teaching methods which provide students with professional skills other than scientific knowledge and technical skills appears to be inevitable.

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