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## Effect of small group discussion in residency education versus conventional education

Ali Tabrizi<sup>1\*</sup>, Hojjat Hossein Pourfeizi<sup>2</sup>, Hossein Aslani<sup>2</sup>, Asghar Elmi<sup>2</sup>, Fardin Mirza Tolouei<sup>1</sup>, Hassan Taleb<sup>1</sup>, Reza Rikhtegar<sup>3</sup>

<sup>1</sup>Orthopedics Surgery Department, Imam Khomeini Hospital, Urmia University of Medical Sciences, Urmia, Iran

<sup>2</sup>Orthopedics Surgery Department, Shohada Educational Hospital, Tabriz University of Medical Sciences, Tabriz, Iran

<sup>3</sup>Department of Neurology, Neurosciences Research Center (NSRC), School of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran

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### Abstract

**Introduction:** There are various methods of training for medical students in different colleges. Fast knowledge transfer and maximum learning are the main goals of education. Due to the limited time and also high volume of content knowledge during residency, using the best methods of training can play an important role in enhancing the skills of residents. In the current study, small group discussion as a teaching method was compared with the traditional method.

**Methods:** In this cohort study, two groups of residents that had finished a 4-year course of orthopedic residency training programs in Tabriz and Urmia universities of medical sciences was being examined. They were divided in two groups. In order to compare the impact of the training on residents, it was compared with the result of the State Board standardized exam. The number of residents passing the written test and the Objective Structural Clinical Examination (OSCE) per year have been identified and compared with the groups under investigation.

**Results:** Fifty-one residents, including 4 women (7.8%) and 47 men (92.2%), were studied for this purpose. Success rate for the small group discussion in the written exam was 59.2% and in the OSCE was 24% (95% CI). On the other hand, the success rates for the group who were trained in the traditional way were 37% and 16.6% in the written exam and OSCE, respectively. In both cases the differences were significant.

**Conclusion:** The small group discussion method is an effective method in residency training in surgical fields that increases medical students' learning abilities compared to traditional methods of education.

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### Introduction

One of the purposes of medical education is to ensure that medical students and residents have acquired the required qualification for diagnosis and treatment of patients. A way in which the residents' competency can be assessed is still not entirely clear.<sup>1</sup> Since a lot of information and skills need to be taught and transferred to residents quickly, the specific time period in which to provide the training in various fields cannot be determined. Additionally, the simultaneity of the intensive residency program and provision of clinical services in the health centers by residents causes fatigue and reduces the efficiency of education programs at busy educational hospitals. Traditionally, the issuance of a certifying degree at the end of residents' training program is one of the methods of competency

assessment. To earn this certificate, evaluation during the course is required, which takes place with the specialty board examination.<sup>1,2</sup> There are different ways of training for residents. Traditionally, teaching by professors is one of the common training methods. In this method training is usually done unidirectionally with no participation from residents. Therefore, it does not seem to be effective for residents, particularly for surgical residents. Based on the available resources, learning together has some advantages.<sup>1</sup> Direct participation in residency training can play an important role in enhancing residents' capabilities. In this study, two orthopedic residency training methods were compared at two large universities in Northwest Iran. The small discussion group was compared with traditional teaching methods and unilateral education.

\*Corresponding author: Ali Tabrizi, Email: ali.tab.ms@gmail.com



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**Materials and Methods**

In a cohort study, two groups of residents who finished 4 years (2011 to 2015) of orthopedic training courses were studied. In a 4-year period all orthopedics residents in Tabriz and Urmia universities of medical sciences were enrolled. In this study, students who were experiencing academic difficulty or were in the course for more than 4 years were excluded. In addition, students who transferred from other universities in the middle of the study were not enrolled in this experiment. In the current study two methods of residency training were compared, which was the small group discussion and one-sided traditional teaching methods offered by professors. One group of students completed their training based on the traditional method. In the small group discussion group, residents were divided into three sub-groups. In this method residents had two sessions each week in which they were presented with a case study by their professor and they discussed the case and gave their feedback in the class. Before presenting the case, no information or training was given to the residents, therefore they had no chance to prepare themselves for that topic. In order to compare the impact of the training provided to residents, State Board exam results were obtained. The number of residents who passed the written test and the Objective Structural Clinical Examination (OSCE) were compared between the groups. In this study, resident participation was completely voluntary and written informed consent was obtained from all residents. An Ethics Committee of Urmia and Tabriz universities of medical sciences approved the study. Statistical analysis, including descriptive statistics such as frequency, percentage and mean ± standard deviation, was used in this study. Furthermore, analysis of frequencies (chi-square) was used to compare the qualitative variables, and SPSS 17 were used for statistical analysis with a *P* value less than 0.05 considered significant.

**Results**

In this study, 51 residents participated, including 4 women (7.8%) and 47 men (92.2) with an average age of 28 ± 5.4 years. In total, 24 students were trained in the traditional method and 27 in the small group discussion method, and they were compared with each other. According to Table 1, students in the small group discussion were significantly more successful in State Board exams than those in the traditional teaching group. Small group discussion students also had greater success in the written test and the OSCE.

**Discussion**

Education refers to a process in which theoretical or practical data is transmitted to a person so that learning and change in behavior become permanent. Various ways of learning have been introduced for many years. Therefore, the most sufficient method is the method ending in the greatest learning and change.<sup>2-4</sup> One of the common methods of teaching is to set up classes with lectures by a professor on one side and student attendance on the other side. In this method the professor tries to transfer knowledge to students in various ways, including presentations using text, image and speech. One of the keys to success in conveying the concepts is effective communication between the master and each audience member. In this case, the large number of students will make communication difficult between the teacher and each of the students.<sup>4</sup> On the other hand, there are many different ways to activate a two-way learning process for students. The most important way is direct student involvement in the education process and exposing students to a variety of questions, which is called problem-based learning. In this method transferring knowledge is easier and faster.<sup>3</sup> According to a study conducted by Horsburgh and colleagues in 2001 on medical students,<sup>2</sup> the group of students who were trained professionally for working in teams provided better care for patients in comparison to students who were trained in the traditional way. Annamalai and colleagues<sup>4</sup> evaluated the small group discussion method in teaching medical students in 2015. A 2016 study by Arias et al on dental students showed that students in the small group discussion groups scored significantly higher than those in the lecture groups when skill performance was tested. However, in the acquisition of knowledge between the two groups as shown on the written test, there were not any significant differences.<sup>6</sup> This method, which is known as the interactive method, increases the students' thought processes and helps them to communicate more effectively. The interactive method increases the skills of medical students in comparison to traditional methods of learning.<sup>5</sup> According to an experiment conducted by Bobby et al on graduate medical students, students who were trained based on small group discussion had a reduction in their medical error in comparison to other medical students.<sup>5</sup> So far, studies have not been done on this in training residents.<sup>5</sup> In a study of midwifery students by Aghapour et al, group discussion training affected the midwifery students' learning more than the lecture method did, and there was higher information durability.<sup>7</sup> Based on the same results in our study, residents who were trained by the small group

**Table 1.** Comparison of two methods of traditional training and small group discussion

| Variables                   | Small group discussion method<br>n = 27 | Traditional method<br>n = 24 | <i>P</i> value    |
|-----------------------------|---|------------------------------|-------------------|
| Age (year)                  | 28.4 ± 2.3                              | 27.6 ± 7.4                   | 0.2               |
| Pass the board written exam | 16 (59.2%)                              | 9 (24%)                      | 0.01 <sup>a</sup> |
| Pass the OSCE exam          | 10 (37%)                                | 3 (16.6%)                    | 0.03 <sup>a</sup> |

Abbreviation: OSCE, Objective Structural Clinical Examination.

<sup>a</sup>Significant difference.

discussion method had greater success in the State Board exam. Basically, the residency period is short and the volume of content is high, therefore fast knowledge transfer with maximum learning of residents is one of the success factors.

### **Conclusion**

The small group discussion method is an effective method in residency training that enhances their learning ability compared to traditional methods of education.

### **Ethical issues**

The study was approved by Ethics Committee of Urmia University of Medical Sciences.

### **Competing interests**

There is no conflict of interest to be reported.

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