The effect of labeling the body organs on the learning of practical anatomy courses

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Abstract:
Introduction: One of the effective factors in deep learning of the university courses is application of using the active educational methods and facilities for in practicing and reviewing practical anatomy courses. Because learning anatomy is associated with some difficulties, we made an attempt to label the body organ in order to provide an opportunity for students to practice actively and learn this course more efficiently.

Materials and Methods: We studied the effect of labeling anatomical structures on learning by medical students. Two groups of medical students were used in this study. The first group (case group) was composed of students admitted in Jahrom University of Medical Sciences in 2010 where they learned the practical sessions of head and neck anatomy by labeling. The second group (control group) was composed of students admitted in the above university in 2009 and had passed their head and neck anatomy course without labeling the organs. Both groups were matched in other aspects. The mean scores of the two groups were compared using t-test. In addition, we collected evaluation forms filled out by the students.

Results: There was a significant difference between the mean scores of the two groups in anatomy course (P<0.001). Assessment results showed that 50.5% of the students believed attendance in practical anatomy classes using labeling has a very good effect, whereas 38.8% of the students believed labeling has a good effect on learning. Furthermore, 10% of them believed labeling has little effect and 3.75% believed labeling has no effect on learning.

Conclusion: Based on the results of this study, the improvement of case group and the assessment results labeling of anatomical structures has a very important effective in students’ learning.

Keywords: Anatomy, Training Activity, Learning

Introduction
One of the essential problems in medical science professors is how to have students more satisfied with training programs and learning environment. Bertolami believes that one of the main reasons for disappointing students at training programs is the contradiction between contents and forms of training (1). The reason for the failure of some learners, despite being trained by the most capable professors, may be the different learning
preferences (2). Learning styles are cognitive, emotional and physiological features that act as relatively stable indicators of how learners perceive, interact, and respond to learning environment (3). Numerous researches have shown that learning styles are the effective and main determinant of academic success (4). If students are trained in accordance with their learning styles, their learning will improve (5). Reiff and Keefe hold that professors’ better understanding of learning styles can lower students’ dissatisfaction and disappointment, and improve training methods (6 and 8). Suskie believes that professors have to change their teaching methods to make an opportunity for a suitable learning environment in accordance with various learning styles of different students (9). Fleming categorizes learning styles into four types: a visual style in which one learns better through seeing and information presentation; an auditory style in which one learns better through listening and oral trainings; a reading-writing style in which one learns better by taking notes and reading written or published texts; a kinetic style in which one learns by doing practical, experimental samples and manipulating with things in a physical process (10). Medical students need especial practical trainings, as the nature of their major and importance of their profession require them to. Therefore, it is imperative that professors apply various methods and media that are appropriate for their teaching. Choosing between these training methods and media depends on various factors like students’ learning styles both in traditional and virtual trainings. Thus, in a teaching/learning process, it is helpful to the trainers to design training methods through gaining knowledge of a student’s characteristics and needs (11). Studies show that students embrace new practical methods, and are better motivated especially when the methods express the relationship between subjects and clinical issues. (12, 15). Therefore, in training medical students we should take advantage of all motivating methods for learning (16 and 17). A research showed that medical students learn anatomy more easily in practice and with the help of training equipment and diverse training methods (13, 15, 18). Boom et al. showed that learning theoretical and practical anatomy along with the use of training equipment and radiological pictures results in better and more stable learning. Moreover, students will be encouraged to become autonomous learners and find the importance of anatomy in paraclinical interpretations and in medicine (19). Keeping students for a long time at practical anatomy classes, particularly in dissection rooms, is problematic. Therefore, researchers have been trying to find new ways to persuade students to study practical anatomy and to prevent from finishing practical anatomy classes earlier.

Basic sciences and especially anatomy have especial positions in medicine and in fact they are the foundation of medical sciences (20). One of the effective factors in deep learning of anatomy is the application of active training methods and use of facilities for reviewing the practical materials and objectifying them. Learning the structures of body organs in practical anatomy is problematic for medical students. One of the problems is the large number (10-15) of students in each group, making it hard for students to precisely and comprehensively observe certain structures of body organs that are tiny, narrow and delicate, especially arteries and nerves. Therefore, the instructor has to repeat again and again resulting in the boredom of both students and the instructor. Furthermore, since only one person is in charge of presenting course materials, making a smaller group of students (3 to 4 in each group) is not possible. It is because of longer waiting time for students to attend in practical classes which results in the tiredness of
students and increasing the number of teaching hours for the instructor. Students who try to go to the dissection room in their free time to review the anatomy course subjects have certain problems like having forgotten the names of the structures of the body organs and having no access to the instructor, which will result in less motivation in learning and incapability of making clinical use of what they have learned (21-22). However, as students are practically taught by an instructor based on an educational curriculum, measures have to be taken to provide students with an opportunity to go to the dissection room to study the structures of the body organs whether the instructor is there. Labeling the structures of the body organs can provide an opportunity for students to repeat and practice more and finally learn actively.

Materials and Methods

Before a practical training session begins, the instructor partially dissected the corpse and labeled all the structures of the body organs that students had to learn by placing a label on the structure with a plastic thread. Then, the instructor in a practical training session described the structures once for the students and asked the students to inspect the structures of the body organs and to test themselves by applying their knowledge on the structures of the non-labeled corpses. The presumption was that students would remember what they had learned for a longer time if they observed the structures of the body organs again by returning to the dissection room after the class in their free time to review the labeled structures of the body organs in absence of the instructor. After the end of the sessions and having the practical anatomy examination, the scores of the case group and of the control group who passed the class one year ago without labeling structures of body organs were entered into computer for data analysis. To examine the difference between the mean scores of the students, t-test was used. Questionnaires were used to measure satisfaction of 40 students of the case group. The questionnaire was composed of 10 four-point items (three for a very good effect; two for a good effect, one for a little effect and zero for no effects). Through this questionnaire, the different aspects of the effects of this method were measured: autonomous learning, prevention of wasting time and tiredness, more confidence in the veracity of the learned materials, and a better preparation for exams. The reliability of the questionnaire was confirmed as Cronbach’s Alpha was calculated 83% and its validity was confirmed through content validity. The findings were analyzed by SPSS and using descriptive and analytical statistics.

Results

Comparison of the scores of 52 students in case group for practical course of head and neck anatomy with the scores of 43 students in control group proved that the mean score of the students of case group who had experienced the labeling method was 17.208 with a standard deviation of 2.135. However, the mean score for this course among the students of control group who did not experience the labeling method was 14.919 with a standard deviation of 2.657. The difference was significant (p<0.001).

The questionnaires were examined to determine the effect of the method of learning through labeling. The results showed that 50.5% of the students evaluated the effect of the labeling method very good, 38.75% good, 10% little, and 0.75 none (Table 1).

Discussion

The learning styles of medical students vary, as do their ways of using four different learning styles. The most preferred style among medical students is the visual style and the least preferred one is kinetic style in which dentistry students
are mostly interested in (11). This can be attributed to the fact that students learn concepts better if they are presented through conceptual maps, shapes, graphs, patterns, and models because visual sense is the basis of their learning and study methods. It is clear that senses do not have equal roles in human learning. There are different estimations about the share of each sense, but the highest score has always been given to visual sense. Learning through visual sense has been measured 50%, through auditory sense 13%, tactile 6%, taste 3% and smell 3% (11).

Table 1: Number, frequency percentage, score, and standard deviation of students in relation to the effect of labeling the structures of body organs in practical anatomy

<table>
<thead>
<tr>
<th>Factors</th>
<th>Students’ comments</th>
<th>Highly effective Percent (number)</th>
<th>Effective Percent (number)</th>
<th>Little effective Percent (number)</th>
<th>Not effective Percent (number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The effect of labeling body structures on student’s learning at presence of the instructor</td>
<td>52.5 (21)</td>
<td>40 (16)</td>
<td>7.5 (3)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>The effect of labeling body structures on student’s independent learning</td>
<td>45(18)</td>
<td>37.5 (15)</td>
<td>17.5 (7)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>The effect of labeling body structures on increasing practical activity of students</td>
<td>52.5(21)</td>
<td>45 (18)</td>
<td>2.5(1)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>The effect of labeling body structures on better understanding and faster learning</td>
<td>47.5(19)</td>
<td>35 (14)</td>
<td>12.5(5)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>The effect of labeling body structures on preventing from student’s wasting time and tiredness</td>
<td>52.5(21)</td>
<td>37.5 (15)</td>
<td>10(4)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>The effect of labeling body structures on more confidence in accuracy of the learning in later revisions of students</td>
<td>52.5(21)</td>
<td>35 (14)</td>
<td>12.5(5)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>The effect of labeling body structures on preparing students for exams</td>
<td>52.5(21)</td>
<td>45 (18)</td>
<td>2.5(1)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>The effect of labeling body structures on reducing fear from not learning</td>
<td>47.5(19)</td>
<td>47.5 (19)</td>
<td>5(2)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>The effect of labeling body structures on increasing students’ interest in attending practical classes</td>
<td>55(22)</td>
<td>27.5 (11)</td>
<td>15(6)</td>
<td>2.5(1)</td>
<td></td>
</tr>
<tr>
<td>The effect of labeling body structures on students’ satisfaction</td>
<td>47.5(19)</td>
<td>37.5(15)</td>
<td>15(6)</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

This study aimed at evaluating the effect of practical teaching of anatomy through labeling the structures of body organs on students’ learning and comparing it with the training without labeling. This study showed that students learn the practical anatomy better if the structures of body organs are labeled. The significance of the difference between the experimental group and the control group, and that 89.3% of the experimental group considered labeling as effective and highly effective in their learning also confirms this subject. Various studies show that whenever new methods, training equipment and innovations are used even for a short time, students become more enthusiastic about learning scientific materials (12). Rouzbehi and Atlasi’s studies confirm this statement (15, 18). The higher scores of the students in this study also approved of this matter. This study was in compliance with the study by Aminie (11). Pour Qasemi et al. studied the effect of practical presentation of anatomy prior to teaching the theories of anatomy as a pre-organizer of academic progress in dentistry students. They showed that the majority of the students...
felt better with the practical training method prior to theoretical training of anatomy and that they believed this method could facilitate their learning and deep understanding. Moreover, implementation of this method ensured an increase in the scores of the experimental group, despite the fact that the difference was not significant (21). However, taking strategies like practical teaching of anatomy prior to theoretical teaching and/or simultaneous teaching of practical and theoretical materials and use of training equipment and labeling the structures of body organs that was used in this study all contribute to students’ better learning of anatomy. Therefore, we suggest that anatomy instructors apply this teaching method.

References: