

Comparison of Two Teaching Methods, Lecture, and Virtual Teaching, on the Motivation and Academic Progress of Dental Students

Parvin Parvaie¹, Nafiseh Ashoori Moghaddam², Mohammadreza Raeisoon^{3*}

¹Assistant professor, Department of oral and maxillofacial medicine, School of dentistry, Birjand university of medical sciences, Iran, Birjand

²School of dentistry, Birjand university of medical sciences, Birjand, Iran.

³Department of Family and Community Medicine, School of Medicine, Social Determinants of Health Research Center, Birjand University of Medical Sciences, Birjand, Iran

* Corresponding Author: Mohammadreza Raeisoon, Department of Family and Community Medicine, School of Medicine, Social Determinants of Health Research Center, Birjand University of Medical Sciences, Birjand, Iran. Email: raeisoon49@gmail.com.

Received 2022 April 30; Accepted 2022 May 27.

Abstract

Background: Effective education for learning in professional fields, especially dentistry, is one of the necessities of society, and considering the importance of oral and maxillofacial diseases in dentistry as well as the lack of information in the field of comparing modern teaching methods and traditional methods.

Objectives: This study was conducted to compare the effect of two methods of face-to-face education, lecture, and virtual education, on the motivation and academic progress of 6th-semester dental students.

Methods: In this randomized intervention study, 36 students in the 6th semester of dentistry in Birjand were randomly divided into two intervention and control groups. In the control group, the face-to-face teaching method was used in lecture style, and in the second group, the online virtual teaching method was used. Before and after the intervention, the same written test of educational content was taken from both groups, and academic motivation was measured with the Academic Motivation Scale (AMS) of Vallerand et al. The data were analyzed with SPSS software and using descriptive statistics, independent t-tests, and paired t-tests. The P-value was considered significant at the level of 0.05.

Results: The average age of the participants in the face-to-face training group was 23.89 ± 2.826 , and in the virtual group was 23.50 ± 1.855 , which was not statistically significant ($P = 0.629$). There was no significant difference between the average scores of students' motivation and academic progress between the two groups before ($P > 0.05$) and after the intervention ($P > 0.05$). Although there was an increase in students' average scores of academic motivation and academic progress after the intervention between the two groups of face-to-face education and virtual education, there was no statistically significant ($P > 0.05$).

Conclusions: It seems that virtual teaching, like lecture teaching, can be effective in students' academic progress and motivation and can be considered a complementary teaching method.

Keywords: Traditional Education; Virtual Education; Academic Motivation; Academic Progress

1. Background

Medical education aims to acquire knowledge, skills, and necessary attitudes for patient care (1). Traditionally, education is delivered in a lecture, teacher-centered approach (2). Among the advantages of this educational method, it is possible to help the instructor to learn the content better and to encourage the learners, establish a connection between the past and present experiences of the learners, speed up and facilitate the process of acquiring information and receiving feedback from others (3); its disadvantages include the one-way transfer of information, inactivity, pervasive fatigue, long lecture time, and quick forgetting of content; so that 80% of the presented content will be forgotten within eight weeks (4).

On the other hand, it should also be noted that learning and teaching is a complex process that cannot be limited to the classroom space (5); while considering the increasing development of information and communication technology, it seems that the traditional education methods that are implemented in the present era alone do not meet the educational needs (6). Today, one of the prominent educational methods is electronic and virtual education, in which the teacher and the learner communicate with each other despite physical distance; with the tools that technology has made available to them, educational content is provided through electronic services (7).

In electronic education, there is no need to change the



learner's lifestyle, and it does not require them to leave their job or move to another place; it also provides the possibility of unlimited access to information (5). Virtual education also has disadvantages, such as the reduction of human and emotional interactions and the lack of face-to-face communication (3).

One of the ways to evaluate the effectiveness of educational methods is to examine their impact on the academic progress of students (8). Academic progress refers to a person's learning or acquired ability in academic subjects (9). Academic motivation is an important factor in students' academic progress (10).

Motivation to progress is an attribute that can be increased through education; the family environment and social environment play a fundamental role in its development. In the case of students, motivation to progress is of particular importance because they have the motivation to find the educational position, the achievement of the goal, or a certain degree of competence in their work and profession, which ultimately achieves the success necessary for learning. The low level of motivation has caused depression, anxiety, and pessimism; on the other hand, it has led to a drop in the academic performance of medical students (11).

Furthermore, motivation is defined as a set of factors that lead a person to a specific goal. In this regard, people with various motivations, which are affected by social acceptability, personal interests, growth, and physiological needs, choose their field of study and job and enter university or the labor market (12,13). Therefore, the necessity of conducting research investigating the effectiveness of modern educational methods compared to traditional methods increases several times (11). The results of previous studies in this field are mostly in favor of the greater effect of virtual and online education, but some studies have considered the effect of both on the academic progress of learners to be the same.

As in the study by Chao et al. (14), Hannay and Newvine (15), Moazami et al. (16), Zarif Sanaiey et al. (17) and Azizi et al. (18), the positive effect of online education on learning has been reported more than traditional education, and in the studies of Rosenfeld (19), Kuhpayehzadeh et al. (20) they have equated the effect of online education and traditional methods on learning. However, in the study by Hale et al. (21), the effect of traditional education on learning was more than online education.

2. Objectives

Considering that the course of oral and maxillofacial disease is one of the important and main courses in dentistry and learning it as well as possible has a great impact on student's performance in the future, choosing the best way to teach it is also of great importance. Therefore, this study was conducted to compare the

effect of two teaching methods in, person and virtual teaching, on the motivation and academic progress of 6th-semester dental students.

3. Methods

3.1. Type of Study and Statistical Population

The statistical population in the current randomized intervention study consisted of 36 dental students in the 6th semester of Birjand University of Medical Sciences, who were randomly divided into two groups of 18 (face-to-face training (control) and virtual training (case) group. All students entered the study after completing an informed consent form.

3.2. Research Tools

The data were collected through a three-part questionnaire, including demographic information, an academic progress questionnaire, and an academic motivation questionnaire. Demographic information included age and sex. The student's academic progress level was measured based on the test score before training and the final test score in the teacher's evaluation.

In order to measure academic motivation, Vallerand et al.'s Academic Motivation Scale (AMS) was used (22). This questionnaire has two dimensions: Internal academic motivation (13 questions), external academic motivation (8 questions), and academic demotivation (4 questions).

In each subject, based on a seven-point Likert scale, the student determines his level of agreement or disagreement with each subject, so that the number one indicates completely disagree, the number seven indicates completely agree, and the number four indicates the middle level or 'no disagree' or 'no agree.' The validity and reliability of this questionnaire have been measured in the study of Javadi and Faryabi (23). In that research, the reliability of the questionnaire used by the Cronbach's alpha method was +0.85, and the face validity (Cronbach's alpha) was calculated for the internal motivation, extrinsic motivation, and demotivation components as 87%, 73%, and 82%, respectively (23).

3.3. Inclusion and Exclusion Criteria

All dental students in the 6th semester who had chosen the course unit "oral and maxillofacial diseases" and agreed to participate were included in the study. Students absent for more than two sessions were excluded from the study.

3.4. Implementation of the Study

After familiarizing the students with the steps of conducting the research and obtaining informed consent, completing the questionnaire, and taking the pre-test before the intervention, in the first group, the lecture method (attendance in the classroom) was used,

and in the second group, the online virtual method of education was used. The trainer, training content (multiple chronic oral ulcers), number (4 sessions), and duration (45 minutes) of each training session were the same for both groups. At the end of the educational intervention, the same written test of the taught content was taken from both groups, and the academic motivation questionnaire was completed again. In order to investigate the impact of virtual education and lecture-style education on students' motivation and academic progress, the average scores before and after and the average changes observed in the scores before and after were calculated.

3.5. Statistical Analysis

Data analysis was done using SPSS 22 software. Qualitative indicators were analyzed with central indicators (mean and standard deviation), and research hypotheses were analyzed with independent t-tests and paired t-tests.

3.6. Ethical Considerations

This study was approved by the ethics committee of

Birjand University of Medical Sciences with code IR.BUMS.REC.1399.233. In addition, to comply with ethical considerations, after collecting the post-test questionnaires, if the score of the students in the intervention group was lower than expected, an in-person class was held for the virtual education group.

4. Results

The average age of the participants in the face-to-face training group was 23.89 ± 2.826 , and in the virtual group was 23.50 ± 1.855 ; however, this difference was not statistically significant (P -value = 0.629). In addition, in the face-to-face training group, 33% of the participants were male, and in the virtual training group, 67% were female, and in terms of gender, no significant difference was observed between the two groups (P -value = 0.13).

The results of the study showed that there is no significant difference between the average score of students' motivation between the two groups before (P -value = 0.123) and after the intervention (P -value = 0.530) (Table 1). Furthermore, there is no significant difference between the average score of student's academic progress between the two groups before (P -value = 0.298) and after the intervention (P -value = 0.348) (Table 1).

Table 1. Comparing the Average Scores of Academic Motivation and Academic Progress Before and After the Intervention in Two Groups (Face-to-Face Education and Virtual Education) a

	Face-to-Face Training	Virtual Teaching	P-Value
Educational motivation			
Before intervention	138.72 ± 14.97	126.83 ± 28.15	0.123
After intervention	146.00 ± 18.51	141.33 ± 25.10	0.530
Achievement			
Before intervention	7.67 ± 2.43	8.67 ± 3.20	0.298
After intervention	18.11 ± 1.02	18.39 ± 0.70	0.348
Changes in the average score of educational motivation	7.28 ± 25.99	14.5 ± 27.44	0.423
Changes in the average score of academic progress	10.44 ± 2.57	9.72 ± 3.00	0.444

^aValues are expressed as mean ± SD.

The average score of academic motivation in both groups increased after the intervention. However, the study results showed that the increase in the average motivation score of students after the intervention between the two groups of face-to-face education and virtual education is not statistically significant (P -value = 0.423).

Also, the average score of academic progress in both groups increased after the intervention, and the amount of academic progress in the virtual group was slightly higher than in the face-to-face group after the intervention. However, this increase in the average score of students' academic progress after the intervention between the two groups of face-to-face education and virtual education is not statistically significant (P -value = 0.444)

(Table 1).

5. Discussion

In the current study to investigate the effect of in-person education (lecture) and virtual education on the motivation and academic progress of 6th-semester dental students, the students of the two groups did not differ in terms of age and gender, and there was no significant difference in the motivation score and academic progress of the students before and after the intervention. Therefore, according to the results of this study, virtual education can be as effective as lecture-based education in promoting and increasing students' academic progress and motivation. Some background variables investigated in

this study, such as age and gender, were the same in the two virtual and traditional educational groups, and no significant difference was observed.

While in the study of Reime et al., there was a significant difference in relation to age and gender (24). Considering the date of conducting the study, perhaps the passage of time and the improvement of the economic and social situation have caused an increase in access for both genders at different ages (25).

The mean and standard deviation of the students' academic progress and motivation test were similar in both virtual and traditional education groups; also, no significant difference was observed between them. The use of communication tools and the participation of students and their interaction with each other are effective in the degree of satisfaction and success of virtual educational courses.

Therefore, the new method can be used like traditional education by ensuring students' satisfaction. Although virtual education has positive points, this method needs more facilities (25). Obviously, because the teacher explains the educational content in the traditional method in detail, it can lead to the facilitation of the learning process (26).

In order to increase the motivation and attractiveness of the lesson environment in the electronic method, it is necessary for teachers to spend more time and build suitable interactive environments and combine images with text in a more practical way (27).

According to the current findings, it can be concluded that there is no statistically significant difference in the level of students' knowledge about the theoretical course of oral and dental diseases in two traditional and virtual methods, and there is a significant difference in speech. The results of research by Zolfaghari et al. under the title effect of two methods of electronic education and lectures on the learning of maternal and child health in nursing students showed that in the traditional education method, the motivation of students is higher and considering that in the classroom, the teacher plays a motivator role, they perform and attract the attention and motivation of the learner. In addition, in the electronic learning method, more arrangements should be made to attract the attention and motivation of the learner (28).

In agreement with these findings, Nouhi et al. revealed that electronic education is preferable to the lecture method. The results of their study, which examined nursing care education in lecture and electronic form, showed that nurses could substitute the electronic method for traditional education in the field of education. However, samples were not selected randomly, and all students passed the unit in the 6th to 8th semesters. Also, the number of samples in both groups was not equal, which may cause bias in the obtained results (29).

Hannay and Newvine, in their study of the perception of distance education compared to traditional education, evaluate why students choose distance education

and their perception of how the course works, and the quality and difficulty of online education compared to traditional classroom education courses. They observed that most students prefer distance learning since it allows them to moderate other factors that prevent them from participating in the classroom, such as time, long hours of work, and family commitments (15).

Considering the importance of the teaching method of education through the electronic environment and its effectiveness on the development and creativity, and improvement of academic performance, applied, and targeted research is expected for the efficiency and effectiveness of new methods and technologies in education should occur with the help of electronic resources continuously. Also, it seems necessary to train specialized human resources to implement the E-learning plan to a more favorable level in the university. In addition, due to the uniformity of the curriculum in the country, it is better to conduct further studies in the dental schools of the country to gain efficiency and more benefits by confirming the advantages of the virtual education method in this course, compared to the use of this superior model in other theoretical courses and the use of its valuable merits such as saving time, costs, educational area, and valuable professors.

5.1. Conclusions

Virtual teaching, like lecture teaching, can effectively promote and increase academic progress and motivation in students and can be considered a complementary teaching method.

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