

The Effect of Orthodontic E-Learning on the Quality of Surgical Splint Fabrication

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ABSTRACT

Background: E-learning is a latest way of learning practical orthodontic skills for postgraduate orthodontic students.

Aim: To find out and compare the effectiveness in terms of improvement of skills, of e-learning versus traditional learning for surgical splint fabrication.

Methods: The study was conducted on postgraduate orthodontic students. The students in one group were trained to do orthognathic surgical splint fabrication by traditional practical training while students in other group were trained to do surgical splint fabrication by same method plus e-learning. The e-learning consisted of video clips and power point presentations on the topic of surgical splint fabrication.

Results: Mean scores of the e-learning group were significantly higher than that of traditional learning group for surgical splint fabrication. Thus it was concluded that e-learning combined with traditional learning can improve the practical orthodontic skills of postgraduate students for surgical splint fabrication.

Conclusion: E-learning combined with traditional learning can improve the practical orthodontic skills of postgraduate orthodontic students for surgical splint fabrication.

Keywords: E-learning; Traditional learning.

INTRODUCTION

Orthodontic education needs vast resources with increasing demands. According to one survey that was conducted in 23 European countries and in another study, it was found that there is lack of faculty members at undergraduate and postgraduate level of orthodontics^{1,2}.

Due to lack of resources and shortage of orthodontic faculty, e-learning has therefore become popular. E-learning might compensate for lack of learning resources, shortage of orthodontic faculty and could supplement traditional orthodontic teaching.³ A recently conducted systematic review concluded that e-learning is as effective as other learning methods in dentistry.⁴ Lindquist et al. in a study showed that e-learning was equally effective as seminars for learning of removable prosthesis designing⁵.

There are several advantages of e-learning reported in the literature; more control over time and speed of learning, easily accessible, active interaction, replication of real world learning, reinforcement of knowledge and skills, and self assessment^{4,6-8}.

There is on any local Pakistani study on the effectiveness in terms of improvement of skills, of e-learning versus traditional learning for orthodontic practical skills. Therefore the aim of present study was to find out and compare the effectiveness in terms of improvement of skills, of e-learning versus traditional learning for surgical splint fabrication. The present study was designed with goal of shift from traditional learning to e-learning for learning of orthodontic practical skills.

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MATERIAL AND METHODS

The study was conducted at de'Mont Dental College, Lahore, Pakistan, where 20 postgraduate orthodontic students were trained to do surgical splint fabrication. The duration of study was 2017-2019. The design of study was prospective quasi-experimental study.

The students in one group (n=10) were trained to do labial bow surgical splint fabrication by traditional practical training while students in other group (n=10) were trained to do the fabrication by same method plus e-learning. The e-learning consisted of video clips and power point presentations on the topic of surgical splint fabrication download on the smart phone devices. Following this, skills were evaluated using special 15-point checklist⁹.

The scores of both the groups were calculated and presented in the form of mean and standard deviation. The scores of both the groups were compared by applying t-test. Following this student's feedback was also taken regarding e-learning experience and traditional learning.

RESULTS

Results showed that mean scores of the e-learning group were significantly higher than that of traditional learning group (Table I). The mean score of the e-learning group was $16.54 \pm 1.32/20$, while mean score of the traditional learning group was $13.12 \pm 1.21/20$. The value of t was 2.14 while p value was 0.011 which showed that mean scores of the e-learning group were significantly higher than that of traditional learning group (Table 1). The student's feedback (n=20) was positive regarding e-learning experience.

Table 1: Comparison of both the groups (t-test)

| Traditional Group (Mean ± SD) | E-learning Group (Mean ± SD) | P | t |
|----------------------------------|---------------------------------|-------|------|
| 13.12±1.21/20 | 16.54±1.32/20 | 0.011 | 2.14 |

DISCUSSION

E-learning can compensate for some deficiencies and limitations of traditional learning for learning of practical orthodontic skills. The objective of present study was to find out and compare the effectiveness in terms of improvement of skills, of e-learning versus traditional learning for surgical splint fabrication.

The design of study was prospective quasi-experimental study. There is on any local Pakistani study on the effectiveness in terms of improvement of skills, of e-learning versus traditional learning for orthodontic practical skills. The present study was designed with goal of shift from traditional learning to e-learning for learning of orthodontic practical skills.

The students in one group were trained to do the surgical splint fabrication by traditional practical training while students in e-learning group were trained to do the fabrication by same method plus e-learning. The e-learning consisted of video clips and power point presentations on the topic of surgical splint appliance fabrication. Following this, practical skills were evaluated using special checklist⁹.

Results of the present study showed that mean score of the e-learning group was 16.54±1.32/20, while mean score of the traditional learning group was 13.12±1.21/20. The value of t was 2.14 while p value was 0.011 which showed that mean scores of the e-learning group were significantly higher than that of traditional learning group for surgical splint fabrication. The results are in agreement with the findings of Kachoei et al. who reported that mean score of the traditional learning group was 14.2±1.4/20, while mean score of the e-learning group was 15.15±1.18/20¹⁰. The results are in contrast with the findings of Kachoei et al. who reported that mean scores of the e-learning group were insignificantly as compared with the traditional learning group for Adams clasp and Z-spring fabrication¹⁰. A recently conducted systematic review also concluded that e-learning is as effective as other learning methods in dentistry⁴. Lindquist et al. in a study showed that e-learning was equally effective as seminars for learning of removable prosthesis designing⁵. Bains et al. reported that blended learning is more effective than e-learning for learning of cephalometrics¹¹. Ludwig et al. reported that blending learning showed better improvement in results in teaching of cephalometric to undergraduate students compared to using a traditional teaching method alone¹². Results are not in accordance with Schorn-Borgmann et al. who reported that e-learning did not improved in the outcome quality of orthodontic appliances⁹.

There are certain limitations of e-learning, such as, lack of IT skills, isolation concerns, time, usage issues, cost, initial program development and copyright issues¹³⁻¹⁸.

The small sample size, quasi experimental design and one centric approach are the main limitations of the present study; however, within the limitations of the current study, it was found that e-learning combined with traditional learning can improve the practical orthodontic skills of students for surgical splint fabrication. Further studies with increased sample size are suggested to find out and

compare the effectiveness in terms of improvement of skills, of e-learning versus traditional learning.

CONCLUSION

E-learning combined with traditional learning can improve the practical orthodontic skills of postgraduate orthodontic students for surgical splint fabrication.

REFERENCES

- Sieminska-Piekarczyk B, Adamidis JP, Eaton KA,. A survey of perceived problems in orthodontic education in 23 European countries. *J Orthod* 2000; 27: 343–348.
- Lindauer SJ, Peck SL, Tufekci E, Coffey T, Best AM. The crisis in orthodontic education: goals and perceptions. *Am J Orthod Dentofacial Orthop* 2003; 124: 480–487.
- Reynolds PA Do we need "e" in learning? *Br Dent J* 2005; 199: 5–6.
- Rosenberg H, Grad HA, Matear DW. The effectiveness of computer-aided, self-instructional programs in dental education: a systematic review of the literature. *J Dent Educ* 2003; 67: 524–532.
- Lindquist TJ, Clancy JMS, Johnson LA, Wiebelt FJ. Effectiveness of computer-aided removable partial denture design. *J Prosthodont* 1997; 6: 122–127.
- Aly M, Elen J, Willems G. Instructional multimedia program versus standard lecture: a comparison of two methods for teaching the undergraduate orthodontic curriculum. *Eur J Dent Educ* 2004; 8: 43–46
- Turner PJ, Weerakone S. An evaluation of a hypertext system for computer-assisted learning in orthodontics. *Br J Orthod* 1993; 20: 145–148.
- Gupta B, White DA, Walmsley AD. The attitudes of undergraduate students and staff to the use of electronic learning. *Br Dent J* 2004; 196: 487–492.
- Schorn-Borgmann S, Lippold C, Wiechmann D, Stamm T. The effect of e-learning on the quality of orthodontic appliances. *Advances Med Edu Practice*. 2015;6:545.
- Kachoei M, Mohammadi A. Comparison of the Effects of Traditional with Combined (Traditional and Electronic) Educational Methods on Promoting the Practical Skill of Fabricating the Removable Orthodontic Appliance. *Iranian J Med Edu*. 2016;16:399-406.
- Bains M, Reynolds PA, McDonald F, Sherriff M. Effectiveness and acceptability of face-to-face, blended and e-learning: a randomised trial of orthodontic undergraduates. *Eur J Dent Edu*. 2011;15(2):110-7.
- Ludwig B, Bister D, Schott TC, Lisson JA, Hourfar J. Assessment of two e-learning methods teaching undergraduate students cephalometry in orthodontics. *Eur J Dent Edu*. 2016;20(1):20-5.
- Clark RD, Weerakone S, Rock WP. A hypertext tutorial for teaching cephalometrics. *Br J Orthod* 1997; 24: 325–328.
- Hobson RS, Carter NS, Hall FM, Atkins MJ. A study into the effectiveness of a text-based computer-assisted learning program in comparison with seminar teaching of orthodontics. *Eur J Dent Educ* 1998; 2: 154–159.
- Gupta B, White DA, Walmsley AD. The attitudes of undergraduate students and staff to the use of electronic learning. *Br Dent J* 2004; 196: 487–492.
- Grigg PA, Stephens CD. A survey of the IT skills and attitudes of final year dental students at Bristol University in 1996 and 1997. *Eur J Dent Educ* 1999; 3: 64–73.
- Browne L, Mehra S, Rattan R, Thomas G. Comparing lecture and e-learning as pedagogies for new and experienced professionals in dentistry. *Br Dent J* 2004; 197: 95–97.
- Welk A, Rosin M, Seyer D, Splieth C, Siemer M, Meyer G. German dental faculty attitudes towards computer-assisted learning and their correlation with personal and professional profiles. *Eur J Dent Educ* 2005; 9: 123–130.

