Effect of dental laboratory exposure on dental students: A preliminary investigation

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Abstract

Background:
Teaching dental materials in first and second BDS training years is a very demanding task. The theory can be taught but the relevant clinical and laboratory procedures can be shown only in third and final BDS. Therefore, understanding can be improved if technical laboratory procedures are shown live to these students in early years.

Methodology:
An early laboratory exposure was planned for second BDS students related to various dental materials including dental ceramic, waxes and casting procedures. 60 students were divided in 2 groups of control and experimental respectively. Pre-test and post-test were administered. Semi-structured interviews were conducted to know their perceptions regarding the intervention.

Results:
The mean scores were pretest 29±3 and for control group 33±2 and for experimental group 45±4. the difference was statistically significant (p<0.001). Common themes that emerged from semistructured interviews included better understanding of the topics especially technical procedures and scope of dental laboratory in clinical practice.

Conclusion:
Early laboratory exposure can be successfully coupled with traditional teaching of dental materials in early years of BDS training to provide a practical context to theoretical learning.

Keywords: Dental Materials, dental education
Introduction

Teaching dental materials for first year dental students is a challenging task. Although basic theoretical concepts in material science can be learnt, prosthodontic application only comes after clinical exposure i.e in third and final BDS when they actually see various procedures in clinics.

Clinical postings give a chance to students to learn this applied aspect, however, laboratory procedures are rarely shown live. This makes the subject difficult to relate and understand especially in early years of training. Therefore present investigation was undertaken in order to enhance understanding of dental materials by giving laboratory exposure to students early in their BDS training years.

Aim

To evaluate effect of dental laboratory exposure on students' performance in dental materials.

Methodology

Total 60 students of II BDS were divided in 2 groups one control & other experimental of 30 each. Control group was given conventional lecture on selected topics and experimental group received lecture, guided tour of laboratory with explanation of equipments and instruments combined with video and live demonstration of related laboratory procedures. Dental materials included dental ceramic, waxes and casting procedures.

Pre-test and post-test were administered. Semi-structured interviews were conducted to know their perceptions regarding the intervention. In the present study author with previous experience of conducting such interviews & handling qualitative research and qualified (MDS) female Prosthodontist, working as a associate professor at the present institute where the study was carried out conducted the interviews. Interviews were preceded by observation, informal and unstructured interviewing in order to develop a keen understanding of the topic of interest necessary for developing relevant and meaningful semi-structured questions. Later a pre-validated interview guide with open ended questions was used. Participants were explained regarding her occupational status as well as research background before the interviews began. The data was collected at workplace and recorded by taking notes. On an average one interview lasted for 15 min. data saturation was discussed. Repeat interviews were not carried out. Data was not coded. Qualitative content analysis was performed to extract information from the data. Major themes were reported.

The students of control group also got the laboratory exposure after completion of the study.

Ethics approval was obtained from the IRB of VSPM Dental College and Research Centre, Nagpur, India (IEC/VSPMDCRC/30/2017 dated 22/4/2017).

Result

Data analysis was done by paired t test.
The mean scores were pretest 29±3 and for control group 33±2 and for experimental group 45±4. the difference was statistically significant (p<0.001)

Semi structured interviews reveled following themes:

1. It provided context to theoretical learning and enhanced understanding of concepts due to live visuals and interaction with faculty
2. Improved understanding of scope of dental laboratory in clinical practice
3. Facilitated understanding of role of dental technician in success of prosthetic rehabilitation.
4. This intervention should be regularly conducted for teaching dental materials

Discussion

Dentistry is an amalgamation of art and science. Prosthodontics in particular deals with replacement of missing teeth and surrounding oral tissues with artificial materials mainly acrylic, ceramics and metals. Successful rehabilitation of patient demands clinical expertise as well as meticulous execution in dental laboratory to reproduce natural tooth–tissue contours. It is very essential for dental graduate to learn various laboratory procedures and their implications in clinical practice. However, in their BDS curriculum, students are required to perform only limited laboratory procedures related to selected materials, whereas they have to learn theory of all that are used in dentistry along-with fabrication and processing techniques. These procedures are performed in dental laboratories by dental technicians routinely and by observing them live makes understanding easier and facilitates dentist to technician communication in future.

Although knowledge about dental materials is the cornerstone to successful dental practice, very few researchers have investigated dental material teaching-learning techniques\(^1\). In dentistry all laboratory procedures are dependent upon directions from dentist and therefore it is imperative for him/her to learn not only material science but actual functioning of dental laboratory.

There have been studies reporting early clinical exposure and its positive effect on dental students in the literature\(^2,3\) however, dental laboratory exposure has never been investigated.

Keeping this in mind all laboratory procedures related to dental materials syllabus in first and second BDS were listed. Live and video demonstrations of these procedures were arranged for experimental group with one facilitator from faculty and dental technician. Dialogue between technician and students was facilitated by the faculty so as to orient them for future clinical practice and improve communication.

Results show that there was improved understanding of related topics in experimental group as compared to control group evident from their test scores.

This intervention was taken very positively by students reflected by their responses in personal interview.

This study serves needs to be replicated for more number of students at many centers to generalize the results so as to develop a training module to be incorporated in BDS curriculum.
Conclusion

This intervention helped to strengthen students' understanding of theoretical concepts while learning dental materials. It was perceived well by the students and can be used as an adjunct to traditional teaching methods.

Take Home Messages

Dental laboratory exposure alongwith regular lectures and practicals can help students to understand theoretical concepts in dental materials in a better way.

Notes On Contributors

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Acknowledgements

Bibliography/References

1. Schweitzer KL, Cohen PA. Teaching dental materials using the personalized system of instruction. J Dent Educ. 1987 Oct; 51(10):589-93.

2. Lalumandier JA, Victoroff KZ, Thuernagle O. Early clinical experience for first-year dental students. J Dent Educ. 2004 Oct; 68(10):1090-5.

3. Ali K, Zahra D, McColl E, Salih V, Tredwin C. Impact of early clinical exposure on the learning experience of undergraduate dental students. Eur J Dent Educ. 2017 Feb 3.

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Appendices
Declaration of Interest

The author has declared that there are no conflicts of interest.