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# Assessment of knowledge and attitude regarding stem cell regenerative dentistry amongst dental students

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## ABSTRACT

**Objectives:** An emerging area of dentistry is regenerative and stem cell therapy. For these treatments to be successfully implemented in clinical practice, dentists' perspectives and understanding of the principles are crucial, to assess the knowledge of dental students on the potential therapeutic application of stem cells, to assess the attitude of dental students for the acceptance of regenerative treatment modalities, and to determine whether further training in the area is necessary.

**Materials and Methods:** A questionnaire on stem cell regenerative dentistry was distributed to 250 dental students of Private Dental College of Nagpur (Maharashtra), consisting of 17 questions on knowledge and attitudes toward regenerative therapy. The frequencies underwent a descriptive analysis.

**Results:** The postgraduate students have adequate knowledge about stem cell regenerative therapy (95.6%) and they are enthusiastic for the acceptance of regenerative treatment. The majority of dentistry students had no prior training in stem cell therapy (75.60%), although many were eager to pursue more education in this area (67.60%).

**Conclusion:** Most dental students are eager to pursue further training in regenerative dentistry and are supportive of the use of stem cells and regenerative dental therapies. Most participants thought that the subject should be covered in the undergraduate course.

**Keywords:** Stem cell, Regenerative therapy, Pulp

## INTRODUCTION

Adult stem cell research is influencing the development of new endodontic, periodontal, and oral-maxillofacial therapy protocols in dentistry. Mesenchymal stem cells (MSCs) from dental pulp are a valuable source for regenerative medicine and tissue rebuilding.[1]

The first review of regenerative endodontic procedures defined them as biologically based procedures designed to predictably replace damaged, diseased, or missing structures, such as dentin and root structures and cells of the pulp-dentin complex, with live, viable tissues, and preferably of the same origin, that restore the pulp-dentin complex' s normal physiologic functions.[2]

The most complicated procedure, which entails fabricating tissue-engineered dental pulp constructs in a laboratory and implanting them into cleaned and shaped root canals, is referred to as regenerative stem cell procedures. Blood clot revascularization is the simplest treatment for pulp-dentin regeneration. The procedure was created as a result of the groundbreaking experiments in the 1970s, which revealed that following total pulpectomy and partial root filling, new tissue formed in the root canal.[2]

The immune-regulatory capacity and trophic activity of MSCs, in addition to their ability to differentiate, which is essential for tissue engineering, are essential for establishing a regenerative milieu at the sites of tissue injury.[3] The bioactive chemicals that MSCs discharge promote angiogenesis while preventing scarring and apoptosis.[4]

The research on stem cell and regenerative dentistry calls into question whether it is a necessary area of study in the training which needs to be included in undergraduate dental students and in postgraduate programs.[5] There are no data in the scientific literature about dental students ' attitudes and awareness of the potential of stem cell regenerative treatments in dentistry.[1] It is necessary to understand the awareness and attitude of dental students to this new era of treatment modalities.[2] Thus, the aim of this study is to investigate the knowledge and attitude among dental students on stem cell procedures and regenerative dentistry.

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## MATERIALS AND METHODS

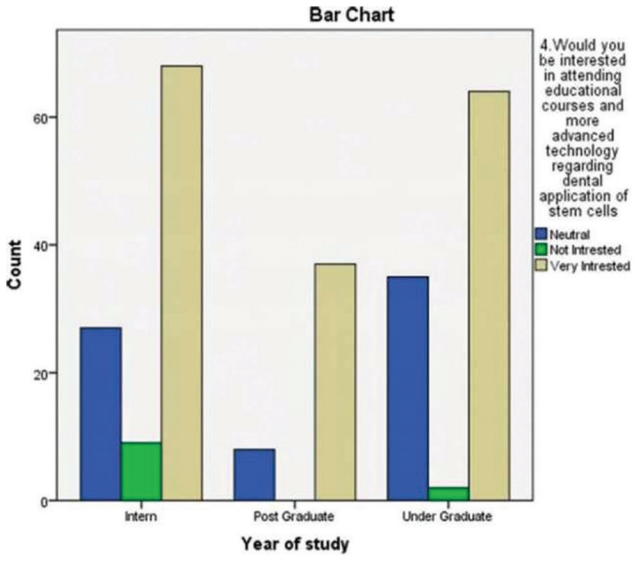
A cross-sectional study was conducted after the Institutional Ethics Committee approval among 250 dental students of the Private Dental College of Nagpur (Maharashtra). The questionnaire which contained 17 questions on assessment of knowledge and attitude regarding stem cell regenerative dentistry was circulated in Google Forms through WhatsApp among 101 undergraduates, 104 interns, and 45 junior residents of the dental college. The questionnaire data were analyzed by the percentage of the number of responses of the total response to get insight into the knowledge of participants and attitudes regarding acceptance of regenerative therapies.

## RESULTS

The study was taken among dental students, in which the total number of participants was 250, out of which 104 students were interns, 101 students were undergraduates, and 45 participants were postgraduates.

### Awareness

On evaluating awareness of stem cell regenerative therapy, there was a statistical significant difference between the years of the study of dental students. About 72.1% of interns, 95.6% of junior residents heard about stem cell regenerative dentistry. The majority of interns (73.1%) and undergraduate students (94.1%) had not attended lectures majority of them interns (65.4%) on stem cells and undergraduate students (63.4%) and almost junior residents (82.2%) were interested in attending on dental application of stem cells on the basis of educational courses and advanced training lectures.

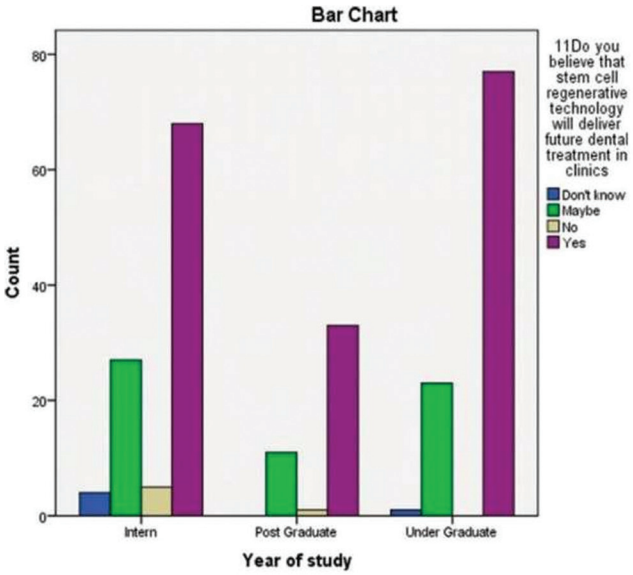


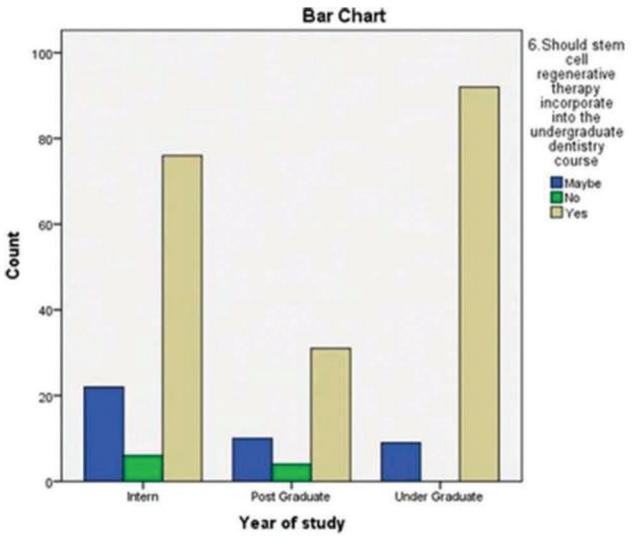

### Knowledge

On asking about the source and therapeutic application of stem cells, most of the junior residents (86.7%) and interns (62.5%) Knew the fact about the origin of dental stem cells. Pulp/dentin recreation and tissue engineering were considered as the most important applications of stem cells by interns (44.2%) and junior residents (77.8%). Moreover, about half of the undergraduates (42.6%) did not know about stem cells.

### Attitude

On assessing the attitude of participants toward incorporating the stem cell regenerative therapy into undergraduate courses, the majority of interns (73.1%), undergraduate students (91.1%), and junior residents (68.9%) responded positively. On examining the acceptance of stem cell regenerative therapy as a future treatment option, the majority of participants 65.4% of interns, 73.3% of junior residents, and 71.2% of undergraduate students were considered.



## DISCUSSION

An area of medicine that is fast developing is the study of stem cells. The finding of stem cells in the pulps of permanent and deciduous teeth, as well as the potential application of dental pulp stem cells for tissue engineering, has sparked a great deal of research in this area.[6] As a result, there is enthusiasm for the use of regenerative procedures in dental clinics, the expansion of lectures, and the integration of these techniques into the college curriculum.[7]

In this study, the dental students showed a willingness to pursue additional stem cell training (79.6%), which may be a sign of their acceptance of the more recent regenerative dentistry treatment approach. Although the majority of dental students (68.40%) thought that dental therapies would be compatible with stem cell tissue regeneration. A small percentage of the dental students in our study (75.60%) had attended lectures or seminars on regenerative dentistry as part of their undergraduate curriculum.[1]

However, more than half of the participants believed that a patient 's fear of stem cell therapy was the biggest barrier to their acceptance of regenerative medicine as was also shown in other studies.[8-10] The nature of the operation would ultimately determine the safety and potential health risks of the regenerative therapy. Matter of concern also was the projected higher expense of regenerative medicines.

Regenerative stem cell therapies will likely be applied in dentistry over the next 10 years, according to one-third of the participants, and more than one-third of participants are unsure about it.[2]

The current sample demonstrated a favorable interest (67.6%) in attending further stem cell training courses and lecture programs and supported the idea of including regenerative therapy in the undergraduate program (79.60%). Most of the dental students are unsure that regenerative dentistry is preferable to implant dentistry and the majority of participants believed that therapy on stem cells did not provide a health risk. Most dental students felt that more hands-on training and short courses to inculcate more knowledge about stem cells in clinical practice will be more helpful to newly qualified dentists.[1]

## CONCLUSION

The findings of the study demonstrated that undergraduate dental students had low levels of knowledge about the use of stem cells in dentistry. Dental students expressed a desire to use regenerative techniques in their practices, a willingness to get additional training, and an interest in attending more lectures on stem cells and tissue regeneration. Dental students thought that the undergraduate dental curriculum should include dental regeneration techniques.

### Declaration of patient consent

Patient's consent not required as there are no patients in this study.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

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