RESEARCH PAPER

Awareness And Perception Of Stem Cell-Based Periodontal Regeneration Therapies Among Dental Specialists And Postgraduate Students In Delhi Ncr: A Cross-Sectional Survey

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Abstract

Stem cell-based regenerative therapies have emerged as promising approaches for periodontal and alveolar bone regeneration. This study evaluated awareness and perception regarding stem cell-based periodontal regeneration therapies among dental specialists and postgraduate students in the delhi ncr region. A cross-sectional questionnaire-based survey involving 357 participants assessed awareness, sources of information, interest in learning, perceived benefits, and likelihood of clinical adoption. Most respondents were aware of stem cell therapies (81.5%), primarily through research publications. A large proportion expressed interest in learning more, particularly through hands-on training. Most participants perceived stem cell therapies as promising for clinical practice, although expected patient acceptance was moderate.

Keywords: Stem Cells, Periodontal Regeneration, Regenerative Dentistry, Alveolar Bone Regeneration.

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I. INTRODUCTION

Regenerative medicine has significantly transformed the approach to tissue repair and reconstruction across multiple medical disciplines. In dentistry, particularly in periodontology, regenerative approaches aim to restore lost periodontal tissues including alveolar bone, cementum, and periodontal ligament[1][2][3].

Alveolar bone loss caused by periodontal disease, trauma, or tooth extraction remains a major clinical challenge for dental practitioners. Such defects compromise both function and esthetics and may complicate implant-supported rehabilitation[4][5].

Traditional reconstructive procedures such as autogenous bone grafts, allografts, and synthetic biomaterials have been widely used for the treatment of alveolar bone defects[6–9]. Among these, autogenous grafts have long been considered the gold standard due to their osteogenic, osteoinductive, and osteoconductive properties. However, these procedures are associated with limitations such as donor site morbidity, surgical invasiveness, and limited graft availability[7].

Biological adjuncts including platelet-rich plasma, growth factors, and enamel matrix derivatives have been introduced to enhance regenerative outcomes. Although these techniques improve healing potential, they often fail to achieve complete functional periodontal regeneration[10].

Stem cell-based therapies have emerged as a promising alternative for periodontal regeneration. Mesenchymal stem cells (MSCs) possess the ability for self-renewal and differentiation into multiple cell types including osteoblasts and fibroblasts[13][14]. Stem cells derived from bone marrow, periodontal ligament, dental pulp, gingival tissue, and dental follicle have demonstrated regenerative potential in preclinical and clinical studies[15][16].

Clinical investigations have reported improved bone formation, enhanced defect fill, and better clinical attachment gain when stem cell-based therapies are used in periodontal regeneration procedures[18][21]. However, despite these promising results, the routine clinical adoption of stem cell therapies remains limited due to concerns regarding cost, regulatory approval, and lack of standardized clinical protocols[21][22].

Recent surveys suggest that although dentists and periodontists show growing interest in regenerative therapies, gaps remain in clinical knowledge, training opportunities, and patient awareness[23]. Therefore, evaluating the awareness and perception of dental professionals regarding stem cell-based periodontal regeneration therapies is essential to facilitate their clinical translation.

The present study was conducted to evaluate the awareness, perception, and readiness for adoption of stem cell-based periodontal regeneration therapies among dental specialists and postgraduate students in the Ghaziabad and Delhi NCR region.

II. MATERIALS AND METHODS

Study design

A cross-sectional questionnaire-based survey was conducted to evaluate the awareness and perception of stem cell-based periodontal regenerative therapies among dental professionals.

Study population

The study included dental specialists and postgraduate students from the following specialties:

- Periodontology and Oral Implantology
- Prosthodontics and Crown and Bridge
- Orthodontics and Dentofacial Orthopedics
- Pedodontics
- Conservative Dentistry and Endodontics

Participants with only BDS qualification were excluded from the study.

Sample size

The sample size was calculated based on an estimated population of approximately 5000 dental postgraduate professionals in the NCR region with a 95% confidence level and 5% margin of error. The final calculated sample size was 357 participants.

Data collection

Data were collected using a structured questionnaire consisting of multiple-choice questions related to:

- Awareness of stem cell-based bone graft therapy
- Source of knowledge regarding the therapy
- Interest in further education
- Perceived clinical advantages
- Likelihood of future clinical adoption

Statistical analysis

Descriptive statistics were used to summarize the collected data. The responses were analyzed and expressed as percentages.

III. RESULTS

A total of 357 dental specialists and postgraduate students participated in the study.

Table 1: Distribution according to specialization

Specialization	Frequency	Percent
Conservative Dentistry & Endodontics	26	7.3
Orthodontics	50	14
Pedodontics	59	16.5
Periodontology & Oral Implantology	124	34.7
Prosthodontics	98	27.5

Fig 1: Distribution according to specialization

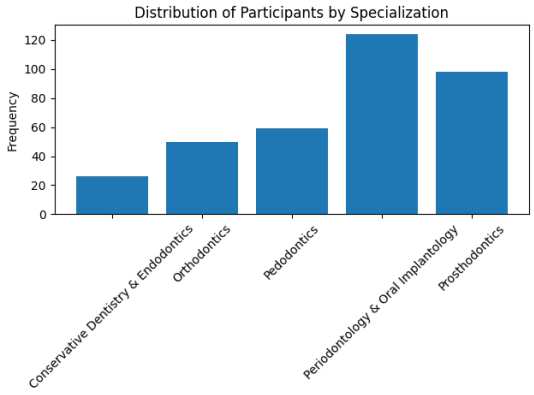


Table 2: Awareness of stem cell therapy

Response	Frequency	Percent
Yes	291	81.5
No	66	18.5

Fig 2: Awareness of stem cell therapy

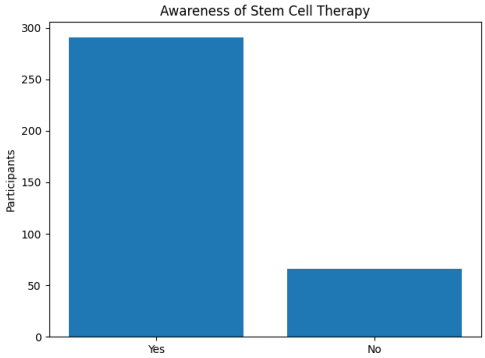


Table 3: Interest in learning stem cell therapy

Interest	Frequency	Percent
Not at all	23	6.4
A little	73	20.4
Somewhat	65	18.2
Interested	196	54.9

Fig 3: Interest in learning stem cell therapy

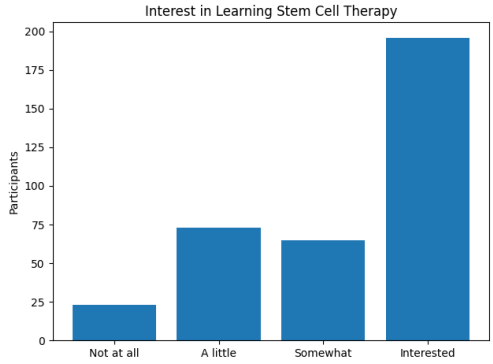
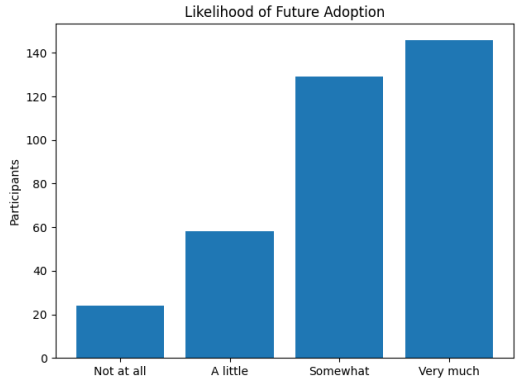


Table 4: Likelihood of adopting therapy

Likelihood	Frequency	Percent
Not at all	24	6.7
A little	58	16.2
Somewhat	129	36.1
Very much	146	40.9

Fig 4: Likelihood of adopting therapy



IV. DISCUSSION

The present study evaluated the awareness and perception of dental specialists and postgraduate students regarding stem cell-based periodontal regeneration therapies. The findings revealed a high level of awareness (81.5%) among participants, reflecting the increasing integration of regenerative medicine concepts in dental education and clinical research[23,24].

Periodontists constituted the largest proportion of respondents, which is expected because periodontal regeneration and alveolar bone reconstruction are central components of this specialty. Previous studies have also reported that periodontists are among the most active adopters of emerging regenerative technologies[3,15].

Participants expressed strong interest in learning about stem cell-based therapies, with hands-on training being the most preferred method of education. This preference highlights the importance of practical training and continuing education programs for clinicians interested in regenerative techniques[24].

Respondents also emphasized the clinical benefits of stem cell-based therapies, including accelerated healing and improved bone quality. Experimental and clinical studies have demonstrated that mesenchymal stem cells can promote osteogenic differentiation and enhance periodontal regeneration through both direct tissue formation and paracrine signaling mechanisms[15,18,21].

Despite professional optimism regarding these therapies, respondents believed that patient preference for stem cell-based treatments might be relatively lower. Similar observations have been reported in previous surveys, where clinicians identified treatment cost, regulatory challenges, and limited patient awareness as potential barriers to widespread adoption[23,24].

Overall, the findings of the present study align with existing literature suggesting that stem cell-based regenerative therapies have strong clinical potential but require further research, training programs, and regulatory clarity before they can become a routine part of dental practice.

V. CONCLUSION

Within the limitations of the present study, it can be concluded that dental specialists and postgraduate students demonstrate a high level of awareness and a positive perception toward stem cell-based periodontal regenerative therapies.

Most clinicians recognize the potential advantages of these therapies, including accelerated healing, improved bone quality and enhanced regenerative outcomes. However, challenges such as treatment cost, regulatory considerations and the need for specialized training remain barriers to their widespread clinical application.

Future research, educational initiatives and policy development will be essential to facilitate the integration of stem cell-based regenerative therapies into routine dental practice.

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Conflicts of Interest

The authors declare no conflicts of interest.

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