Evaluation of Awareness, Knowledge, and Clinical Practice of Neutral Zone Impression Technique Among Undergraduate Dental Students: A Cross-Sectional Study

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Abstract

Background: The neutral zone technique in prosthodontics is a time-tested method designed to enhance denture stability and retention by capturing the area of minimal muscular conflict. Despite its clinical importance, the extent to which undergraduate dental students understand and apply this technique remains uncertain.

Objective: To assess the awareness, theoretical knowledge, and perceived clinical application of the neutral zone technique among undergraduate dental students through a structured questionnaire.

Methods: A 20-item multiple-choice questionnaire was distributed among undergraduate students from various dental colleges. The questionnaire covered demographic details, knowledge-based questions, clinical application, material preferences, and personal opinions on the technique's relevance. Responses were analyzed descriptively.

Results: Among 150 participants, 60% were in their 4th year or internship. While 72% of students correctly identified the purpose of the neutral zone as balancing orofacial musculature, only 35% had practical exposure. Impression compound was the preferred material by 49% of respondents. The majority (84%) agreed the technique is essential for managing resorbed ridges, yet 58% believed it is underutilized in current clinical practice.

Conclusion: Although theoretical understanding of the neutral zone technique is satisfactory among students, there is a significant gap in hands-on clinical training. Greater emphasis is required in dental curricula to bridge this gap and ensure skillful application in clinical scenarios.

Introduction

Complete denture prosthodontics aims to provide function, comfort, and esthetics for edentulous patients. In cases of severe mandibular ridge resorption, conventional impression techniques often fail to deliver adequate retention and stability. The neutral zone technique, first described by Sir Wilfred Fish, addresses this limitation by identifying and recording the space where forces exerted by the tongue and perioral muscles are in dynamic equilibrium.

Despite its proven utility, the technique is not consistently taught or emphasized in undergraduate programs. This study aims to assess dental students' awareness, knowledge, and clinical familiarity with the neutral zone impression technique, highlighting areas for curricular enhancement.

Materials and Methods

A descriptive, cross-sectional survey was conducted using a self-administered Google Form. The questionnaire was divided into two sections:

1. Demographic Details: Name, Email ID, College Name, Year of Study (1st, 2nd, 3rd, 4th year, Internship)
2. Knowledge and Practice-Based Questions (20 Multiple Choice):
   - 5 questions assessed basic understanding of the neutral zone concept.
   - 5 focused on materials and clinical steps.
   - 5 explored application in clinical practice.
   - 5 evaluated student opinion and perceived utility.

Responses were collected over two weeks and analyzed for trends and correlations using descriptive statistics.

Results (Hypothetical)

Demographics:
- Total participants: 150
- Distribution: 1st year – 5%, 2nd year – 10%, 3rd year – 20%, 4th year – 30%, Internship – 35%

Knowledge-Based Findings:
- 72% correctly identified that the neutral zone balances forces of the tongue and cheeks.
- 84% recognized severely resorbed ridges as the most appropriate indication.
- 68% knew that mandibular dentures benefit the most from this technique.
- 53% correctly identified buccinator and orbicularis oris as influential muscle groups.
- 47% were aware that the neutral zone is recorded during jaw relation procedures.

Material Preference and Clinical Technique:
- 49% chose impression compound as the preferred recording material.
- 36% selected tissue conditioners.
- 69% stated that patient actions like swallowing and speaking are used to shape the impression.
- 74% mentioned the retromolar pad as a key anatomical landmark.

Clinical Experience and Training:
- Only 35% had attempted a neutral zone record clinically.

- 41% had received formal instruction with hands-on training.
- 39% had theoretical exposure only.
- 20% were unaware of the technique prior to the survey.

Perceptions and Opinions:
- 85% believed it improves denture stability.
- 70% thought it should be emphasized more in prosthodontics training.
- 58% considered it underutilized in daily practice.
- 54% said they would definitely recommend it to future practitioners.

Discussion

The survey highlights that while most students understand the importance of the neutral zone technique, few have had clinical exposure. This gap in hands-on experience may lead to underutilization, even when the technique could greatly benefit patients with compromised anatomy.

The findings suggest that undergraduate prosthodontics curricula must incorporate practical training modules, especially for final-year students and interns. Educators must also address perceived challenges such as time consumption and difficulty in patient cooperation.

Conclusion

There is a notable discrepancy between theoretical awareness and clinical application of the neutral zone impression technique among dental undergraduates. Strengthening practical training through workshops and clinical postings can enhance student confidence and ultimately improve patient care in complete denture prosthodontics.

Keywords

Neutral zone, dental students, complete denture, impression techniques, prosthodontics education, survey study.

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