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Identifying, Assessing and Solving Problems in Complete Denture Fabrication Procedures

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ABSTRACT

This article provides an in-depth examination of the myriad challenges encountered during the design and fabrication of complete dentures, offering nuanced solutions to elevate prosthetic outcomes. Common issues such as inadequate retention, impaired mastication, phonetic difficulties, and diminished aesthetics are explored through a clinical lens. The article underscores advanced techniques like the neutral zone method and the use of soft liners to counteract instability in highly resorbed ridges. Additionally, the efficacy of implant-supported overdentures is highlighted as a gold standard for addressing severe edentulism, although financial considerations remain a limiting factor. Surgical interventions, along with customized impression strategies, are proposed to enhance both function and patient comfort. This synthesis of technical insights enables clinicians to navigate complex prosthodontic cases, ensuring a more tailored, patient-centric approach to full denture rehabilitation

Keywords: *Complete denture fabrication, procedural difficulties, clinical errors.*

1. INTRODUCTION

Complete denture prosthodontics epitomizes the convergence of technical proficiency and artistic finesse in restoring edentulous arches. In regions like India, where the geriatric population is significant, this procedure assumes critical importance—not only due to its prevalence but also owing to its technique-sensitive nature.

It is imperative for every dental practitioner to possess a fundamental yet comprehensive understanding of complete denture fabrication—a skillset deemed indispensable and therefore integrated into the dental curriculum, beginning in the third year and extending through internship.

Each procedural step in denture fabrication presents opportunities for errors that can significantly impact the final outcome. This study seeks to systematically evaluate and mitigate such procedural difficulties, offering a structured approach to elevate clinical practice and guide practitioners toward higher standards of craftsmanship in complete denture rehabilitation.

Aim

To identify, assess, and solve problems in complete denture (CD) fabrication procedures.

Objectives

1. To guide and help dental educators improve the quality of training of dental graduates.
2. To minimize the chances of errors in the final prosthesis.

Research Questions

a) What kinds of errors and problems occur during complete denture fabrication?

b) Which is the most difficult procedure in complete denture fabrication?

c) What problems or difficulties do patients face during or after denture insertion due to fabrication errors by clinicians?

2. MATERIALS AND METHODS

This questionnaire-based study was conducted among undergraduate students—specifically 3rd year, 4th year, and interns—of the School of Dental Sciences, Krishna Vishwa Vidyapeeth, Karad, and nearby dental colleges. A structured, self-administered, close-ended questionnaire comprising 15 questions related to identifying and solving problems in CD fabrication was circulated using online platforms.

Sampling Strategy

Target Population:

Three groups of students were selected to record responses:

- **Group 1** – 3rd year BDS students who have recently entered the clinics.
- **Group 2** – 4th year BDS students currently practicing in the clinics.
- **Group 3** – Interns who have completed their undergraduate studies.

Sampling Technique: Convenience sampling.

Sample Size Formula:

$n = (Z^2 \times p \times q) / L^2$

Where:

- L = absolute error (5%, 6%, 7%)
- Z = standard normal variate at 5% significance level
- p = 56% (estimated proportion for the most difficult procedure)
- q = 100 – p = 44%

Calculated sample size: *n = 189*

In addition, feedback was collected from patients receiving complete denture prostheses in the Department of Prosthodontics, to document problems encountered during insertion or post-insertion due to fabrication errors.

Data Collection Methods:

A total of 15 questions were distributed via Google Forms to 3rd year, 4th year, and intern students who consented to participate. Data was analyzed using SPSS software version 23. Patient feedback forms were circulated and collected later for additional assessment.

3. LITERATURE SUPPORT AND CLINICAL CONTEXT

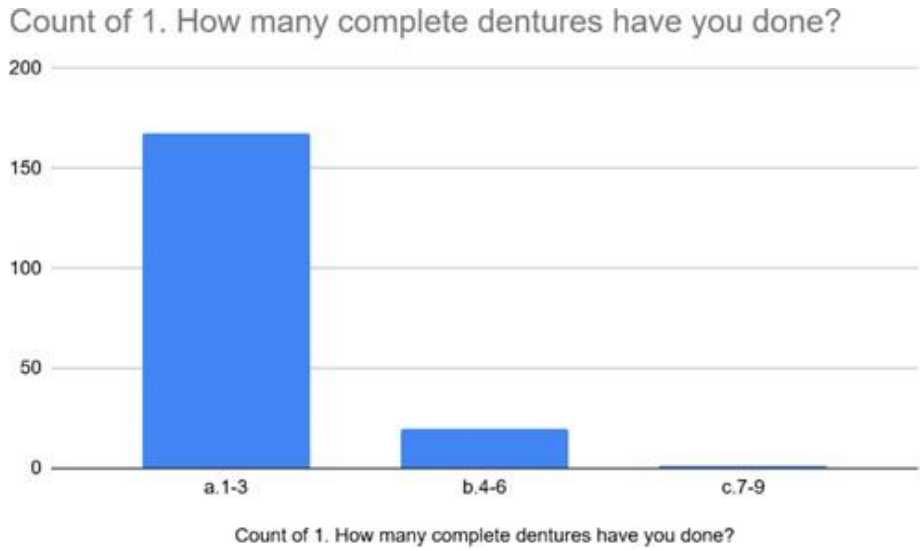
In discussing the challenges of complete denture fabrication, authors such as **Yadav et al.** and **Atwood** emphasize the importance of personalized prosthetic strategies, particularly in cases of residual ridge resorption. Yadav et al. suggest that techniques like the neutral zone and soft liners can greatly improve denture retention and patient comfort. Atwood's research highlights physiological changes post-extraction, stressing the need for adaptive designs to combat ridge resorption.

In addition, **Carlsson** focuses on the consequences of poorly fitting dentures—including compromised oral function—and advocates for better materials and patient education. **Tallgren**, through longitudinal studies, documents the continuous reduction of residual alveolar ridges in long-term denture wearers, underscoring the necessity for regular adjustments and innovative designs to accommodate physiological changes.

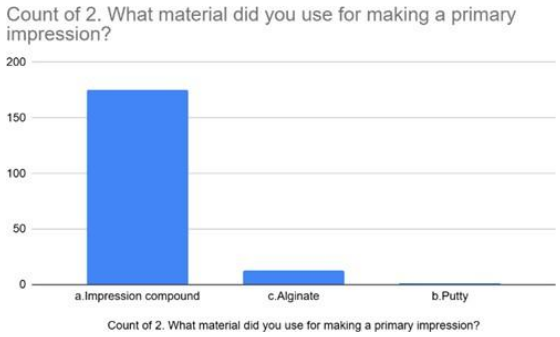
These perspectives converge on the importance of customized, patient-specific solutions for optimizing denture function and ensuring long-term success.

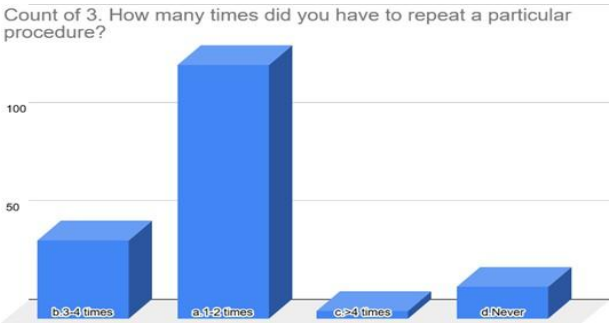
4. RESULTS

The research study revealed a variety of results across different areas of complete denture fabrication. When asked how many complete dentures they had fabricated, 10.6% of respondents reported having completed 1–3 dentures, while a significant majority, 88.9%, had fabricated 4–6 dentures. Only 0.5% reported having completed 10 or more dentures.

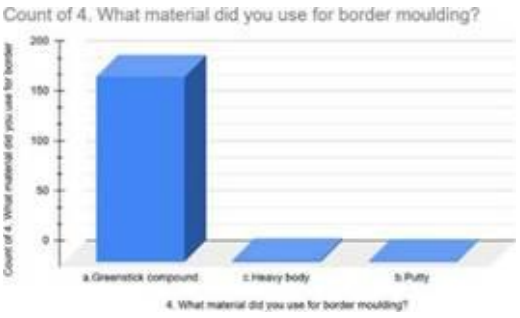


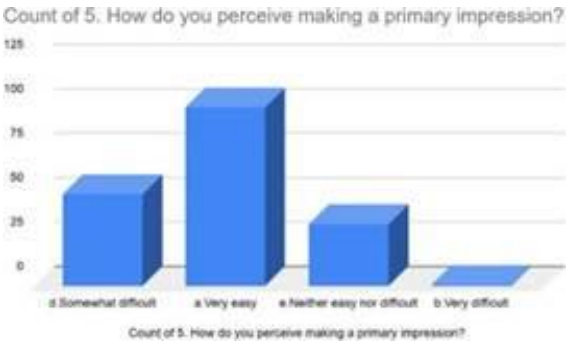
the material used for making primary impressions, 92.6% used alginate,while6.9%usedimpressioncompound,andonly0.5%opted for putty. When it came to repeating a particular procedure, 68.3% of participants reported that they never had to repeat the procedure,while 21.2% had to repeat it 1-2 times, 8.5% repeated it 3-4 times,and 1.5% Regarding repeated it more than four times.





For border moulding, an overwhelming 98.4% used greenstick compound, with small fractions using putty (1.0%) or heavy body (0.6%). The task of making a primary impression was perceived as somewhatdifficultby53.4%ofrespondents,neithereasynordifficult by 27.5%, very easy by 18.5%, and very difficult by just 0.5%.

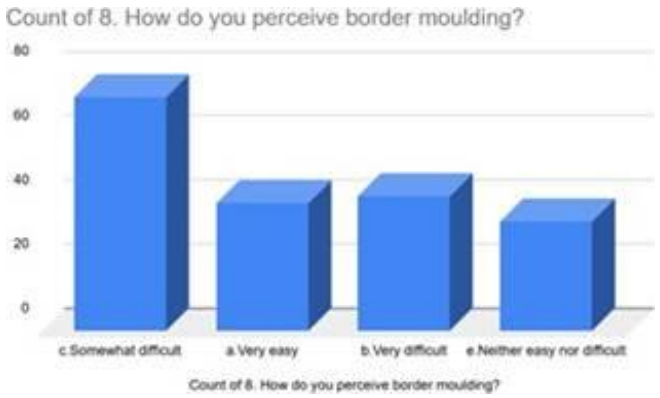


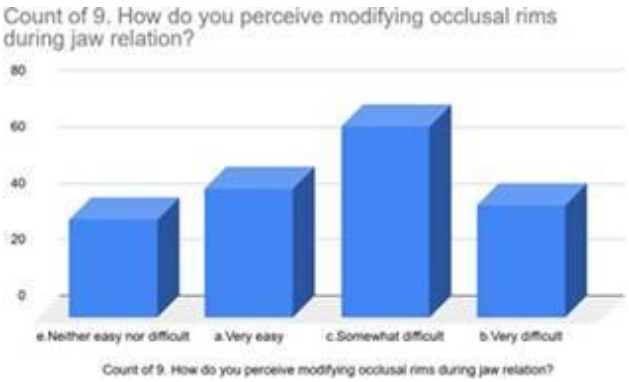


In making a secondary impression, 96.8% of respondents used zinc oxide eugenol, while 2.0% used light body and 1.2% used medium body. The perception of this task was mixed: 47.1% found it

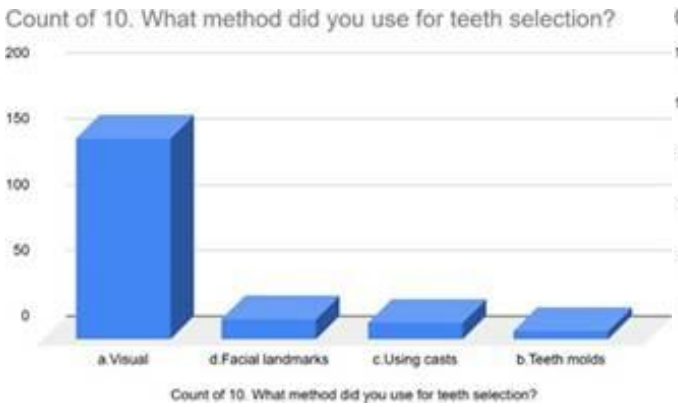
somewhatdifficult,30.2%neithereasynordifficult,19.6%veryeasy, and 1.1% very difficult.

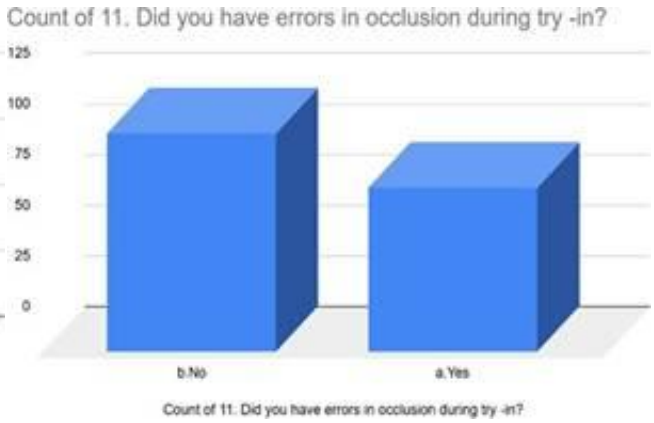
When asked about border moulding, 38.6% of respondents found it veryeasy,22.2%neithereasynordifficult,21.2%somewhatdifficult, and18.0%verydifficult.Modifyingocclusalrimsduringjawrelation was perceived as very easy by 36.0%, somewhat difficult by 21.2%, neither easy nor difficult by 24.3%, and very difficult by 18.5%.





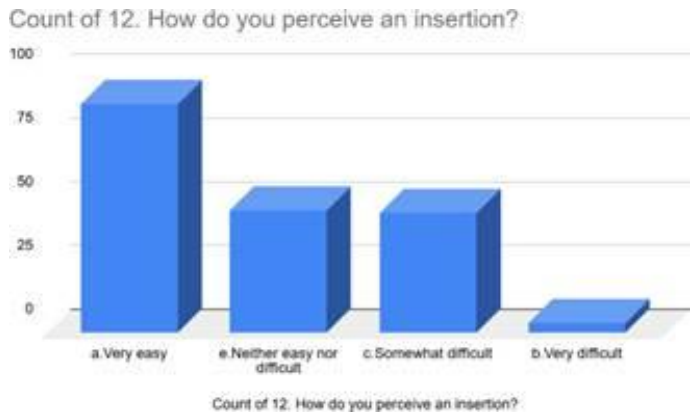
Teethselectionmethodsvaried,with81.0%usingcasts,8.5%using teeth molds, 6.9% relyingonvisual selection,and 3.6% using facial landmarks. When it came to errors in occlusion during the try-in, 57.1% of respondents encountered errors, while 42.9% did not.

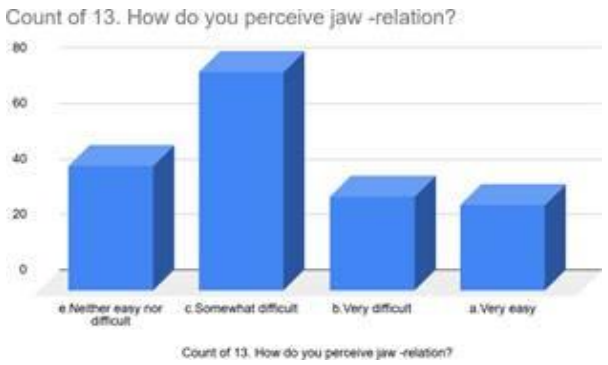




Theinsertionprocesswasperceivedassomewhatdifficultby47.6% of respondents, neither easy nor difficult by 25.4%, very easy by

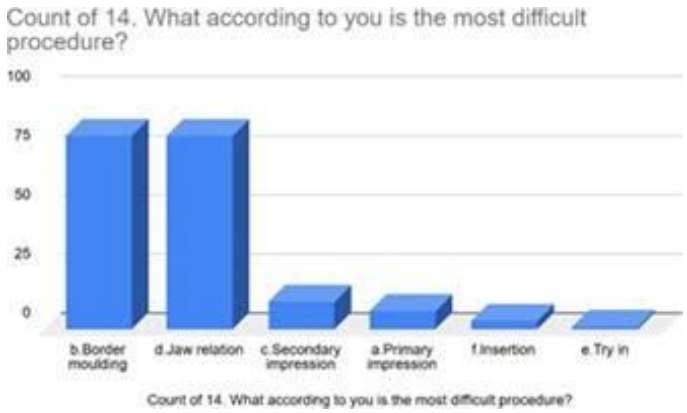
24.9%,andverydifficultby2.1%.Thejawrelationprocesswasseen as very easy by 41.8% of respondents, somewhat difficult by 16.4%, neither easy nor difficult by 18.0%, and very difficult by 23.8%.

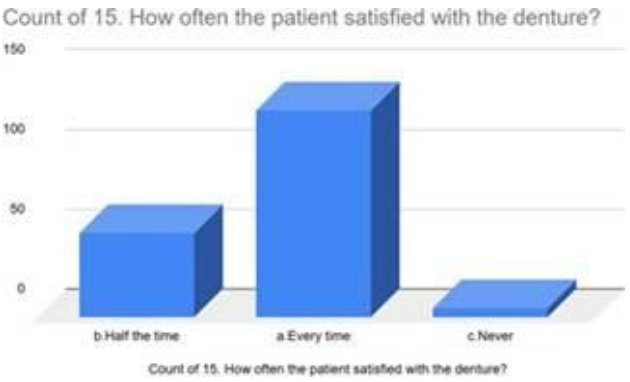




Whenidentifyingthemostdifficultprocedure,43.4%ofrespondents named border moulding and jaw relation, followed by primary impression (6.3%), secondary impression (0.2%), try-in (3.7%), and

insertion(2.0%).





Finally, patient satisfaction with the denture was reported as high, with68.8%ofrespondentsindicatingthatpatientsweresatisfiedhalf the time, 28.0% every time, and only 3.2% never being satisfied.

5. CONCLUSION

Basicknowledgeaboutcompletedentureismusttoidentifyandsolve the difficulties and errors during fabrication of denture.

Thisstudywillbedefinitelyusedtoassessthedifficultareaswhich should be corrected further

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