
A Survey on Commonly Followed Impression Techniques and Materials in Complete Denture Fabrication

Vrushali Padwal, Ajay Gaikwad*, Yusuf AR, Pronob Kumar Sanyal, Shivsagar Tewary, Shubha Joshi

School of Dental Sciences, Krishna Vishwa Vidyapeeth (Deemed to be University), Karad, Maharashtra, India

***Corresponding Author:** Dr. Ajay Gaikwad, School of Dental Sciences, Krishna Vishwa Vidyapeeth (Deemed to be University), Karad Email: ajaygaikwad.vg@gmail.com

Received: 20- March -2023

Revised: 17- April -2023

Accepted: 11- May -2023

ABSTRACT

This study aims to investigate the prevailing practices in complete denture fabrication by examining the choice of impression techniques and materials among dental clinicians and students. A comprehensive survey was conducted involving 140 participants, revealing that 86.4% favor zinc oxide eugenol, while 13.6% opt for impression compound; intriguingly, none utilize impression plaster. The rationale behind the predominant use of zinc oxide eugenol was diverse, with 86.4% emphasizing its ability to record fine details, 38.6% highlighting patient comfort, and 33.6% considering its cost-effectiveness. Edentulism, particularly among those aged 65 and older, presents a substantial oral health challenge. Complete dentures stand as a primary solution to restore both function and aesthetics for this demographic. At the core of denture fabrication lies the impression-making process, a crucial step influencing the ultimate success of the prosthetic intervention. This study delves into the dynamic landscape of impression materials and techniques, acknowledging the historical use of traditional materials like alginate and impression compound. However, it also recognizes the contemporary shift towards elastomeric materials such as polyvinylsiloxane and polyether, heralding enhanced properties in terms of dimensional accuracy, elastic recovery, and ease of use. The objectives of this survey encompass understanding the prevalent choices made by dental clinicians and students, dissecting the factors that drive these preferences, and shedding light on the evolving landscape of complete denture fabrication. The findings not only reveal a predominant inclination towards zinc oxide eugenol but also unveil the nuanced reasoning behind this preference. This survey contributes valuable insights into current practices, offering a foundation for future research directions, educational enhancements, and potential advancements in the field of complete denture prosthetics.

Keywords - survey, impression technique, complete denture fabrication, clinicians.

I. Introduction:

Edentulism, the complete loss of natural teeth, poses a significant challenge to oral health, particularly among individuals aged 65 and older. This demographic often grapples with the consequences of tooth loss, not only in terms of compromised function but also the impact on appearance and overall well-being. The restorative solution commonly prescribed for edentulous patients is the fabrication of complete dentures, a transformative process that involves various critical stages. Among these, the impression-making process stands out as a pivotal step, influencing the success and efficacy of the final denture.

a. Background and Significance

The prevalence of edentulism among the elderly underscores the importance of effective and patient-centric solutions. The demographic shift towards an aging population has magnified the relevance of dental prosthetics, with complete dentures being a primary intervention to restore oral function and aesthetics. According to

research [1], a substantial portion of individuals aged 65 and above experiences edentulism, necessitating the need for accessible and proficient dental prosthetic services.

Complete dentures play a vital role in addressing the challenges posed by edentulism, offering a holistic approach to oral rehabilitation. Beyond functional aspects like chewing and speech, the psychological impact of restoring a patient's smile and facial aesthetics cannot be understated. As such, the process of fabricating complete dentures involves several intricacies, with the impression-making phase serving as the foundation for a successful prosthetic outcome.

b. The Impression-Making Process

The fabrication of complete dentures is a multifaceted procedure, encompassing various stages from preliminary assessments to the final fitting. Among these, the impression-making process holds particular significance. This stage involves creating a negative replica of the patient's oral tissues, which serves as the basis for crafting a denture that fits accurately and comfortably.

The choice of impression technique and material is a critical decision for dental clinicians and students involved in complete denture fabrication. Different clinical scenarios, material properties, and practitioner expertise contribute to the variability in impression-making approaches. The literature is replete with diverse techniques, ranging from traditional methods using alginate and impression compound to newer elastomeric materials like polyvinylsiloxane and polyether [3,4].

c. Evolution of Materials in Impression-Making

Traditionally, modelling compound and alginate have been the primary materials for preliminary impressions, showcasing the evolution of dental materials over time. However, recent years have witnessed a paradigm shift with the emergence of elastomeric impression materials as viable alternatives. Polyvinylsiloxane and polyether, in particular, have gained recognition for their superior properties, including enhanced dimensional accuracy, elastic recovery, and ease of handling.

The choice of materials extends beyond the preliminary impression, encompassing border moulding procedures and final impressions. While modelling compound has been a traditional choice for border moulding, newer materials have entered the scene, challenging conventional practices. The considerations for selecting these materials include not only their physical and mechanical properties but also their ability to provide optimal detail reproducibility and ease of use [5-9].

d. Need for a Comprehensive Survey

The landscape of impression materials and techniques for complete denture fabrication is dynamic, influenced by technological advancements, research findings, and practitioner preferences. Previous surveys have indicated variability in the approaches adopted by clinicians. However, as dental practices evolve, it becomes imperative to conduct updated surveys to capture the current trends and preferences among dental clinicians and students.

e. Objectives of the Study

Given the evolving nature of dental prosthetics and the lack of recent studies on impression techniques and materials, this survey aims to fill the gap by providing insights into the current practices in complete denture fabrication. The primary objectives include:

- Assessing the prevalence of different impression materials and techniques among dental clinicians and students.
- Understanding the reasons behind the preference for specific materials and techniques over others.

- Exploring the factors influencing the decision-making process in selecting impression materials for complete dentures.

II. Materials and methods:

Approval by The Institutional Ethics Committee, Krishna Institute of Medical College, Karad was granted before the beginning of the survey.

In January 2023, a questionnaire was made and the link was distributed among 110 students and 30 clinicians on Email, WhatsApp and other social media platform. The clinicians who are members of Indian dental council were chosen because they represent the speciality that focuses on removable prosthodontic care. Also, the questionnaire was distributed amongst the students in dental schools to analyse whether what is taught in the syllabus is in agreement with clinical practice and the reason behind the same.

A self-administered survey included 4 questions related to the construction of complete dentures and 3 demographic questions. The collected information encompassed demographics such as name, email Id, workplace details (including position and region), and years of professional experience. Additionally, the survey gathered data on complete denture impression materials and techniques, including the commonly preferred material for complete denture fabrication as well as most common technique used method for the same. Also, the reason behind using that technique and material over other. Data collected were entered in a spreadsheet (Microsoft Excel, 2019). The statistical analysis was done using descriptive statistics.

III. Results:

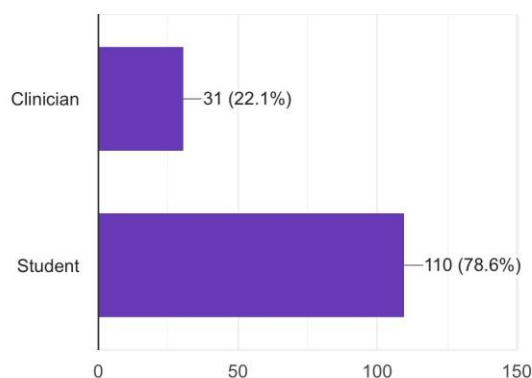


Figure 1. Profession - Clinicians or students (N=140)

There was a total number of 140 participants out of which 110 participants i.e., total 78.6% participants were dental students and total 30 participants i.e., 22.1% were clinicians and 0.1% were both student as well as working as clinician.

Table 1: Knowledge-based questions of study participants (N=140)

Note: N = number, % = percentage

Sr. No.	Options	Percentage
1. Which impression technique do you use for complete denture fabrication?	• Mucostatic impression technique	0.7%
	• Mucocompressive impression	12.9%

	technique	
	<ul style="list-style-type: none"> • Selective pressure impression technique 	87.9%
2. Reasons why you prefer this technique?		
	<ul style="list-style-type: none"> • Simple technique 	17.9%
	<ul style="list-style-type: none"> • Less time consuming 	15%
	<ul style="list-style-type: none"> • Helps in achieving better retention 	87.1%
3.Which impression material do you use for complete denture fabrication?		
	<ul style="list-style-type: none"> • Impression plaster 	0%
	<ul style="list-style-type: none"> • Impression compound 	13.6%
	<ul style="list-style-type: none"> • Zinc oxide eugenol 	86.4%
4.Reasons why you prefer this material?		
	<ul style="list-style-type: none"> • Cost effective 	33.6%
	<ul style="list-style-type: none"> • Patients comfort 	38.6%
	<ul style="list-style-type: none"> • Record fine details 	86.4%

Study subjects were 140 out of which 30 clinicians and 110 students were submitted their responses. Among which majority of the clinicians who are members of Indian dental council and the students i.e., total 87.9 % participants use selective pressure technique for complete denture fabrication and remaining 12.9 % use Mucocompressive impression technique and 0.7 % Mucostatic impression technique and the rationale provided for it as 87.1 % for achieving better retention, 17.9 % for simple technique, and very minimum i.e., 15 % chosen this technique as they feel it is less time-consuming technique.

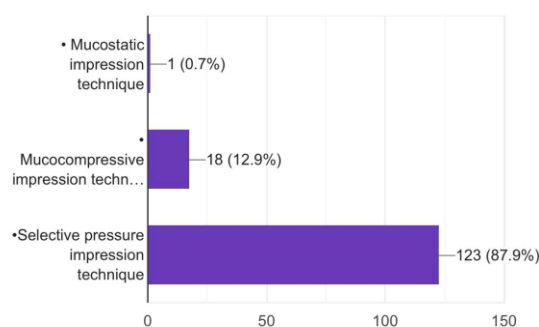


Figure 2: Impression technique routinely uses for complete denture fabrication.

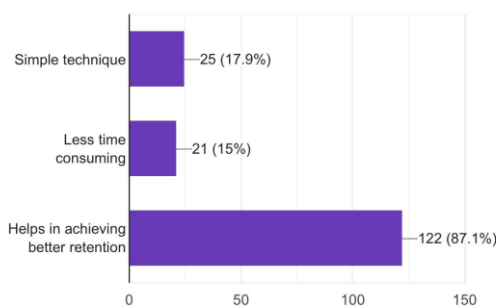


Figure 3: Reasons behind using this technique.

As well as among 140 participants, 86.4% use zinc oxide eugenol and 13.6% participants use impression compound and nobody i.e., 0% use impression plaster for complete denture fabrication and the reason behind using zinc oxide eugenol is as it records fine details according to 86.4% participants followed by 38.6% participants as they feel it is comfortable for patients during the procedure and very 33.6% participants agree that zinc oxide eugenol is cost-effective.

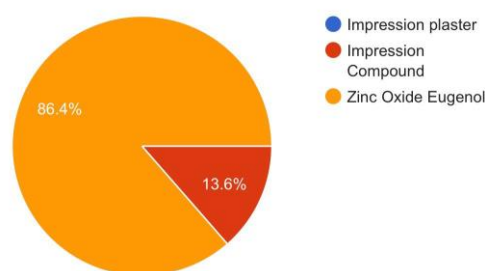


Figure 4: Commonly used impression

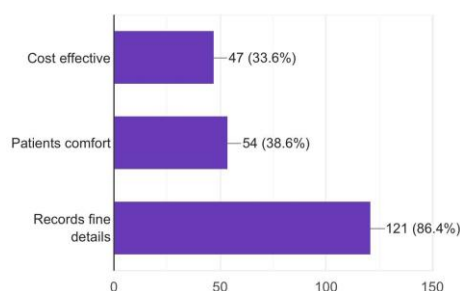


Figure 5: Reasons for using above material for complete denture. impression material.

IV. Discussion:

Creating accurate impressions of edentulous anatomical structures is a crucial step for the success of complete dentures. Various materials and techniques are available for this purpose [10]. In Saudi Arabia, this study highlights differences in the choices of materials and techniques employed by general dentists and specialists for making final impressions in complete denture fabrication. The primary goals of a successful impression are to ensure complete denture retention, support, and stability [11]. Following the manufacturer's instructions for each impression material is essential to produce an accurate replica of the denture-bearing area [12].

V. Conclusion:

There were notable variations in the choice of materials and techniques, reflecting diverse clinical preferences in the fabrication of traditional complete dentures. This research demonstrates the widespread utilization of zinc oxide eugenol for final impression material for complete denture fabrication, aligning with global norms. Furthermore, the study revealed that most practitioners opt for above material as it records fine details and provide patients comfort during the clinical procedure. Years of experience demonstrated a statistically significant impact on the materials chosen by prosthodontists when performing border complete denture fabrication. Geographic location did not exert any influence on the materials and methods employed by prosthodontists in the context of final impressions for complete dentures. In general, there were similar trends observed in the materials and techniques used by clinicians and dental school students.

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