



A SURVEY ON THE APPLICATION OF PROSTHODONTIC TECHNIQUES IN PRIVATE PRACTICE IN GHAZIABAD

Dr. Arjita Dutta	Senior Lecturer In The Department Of Prosthodontics And Oral Implantology I.T.S Dental College, Muradnagar. Delhi - Meerut Road, Muradnagar, Ghaziabad, Uttar Pradesh – 201206
Dr. Rohit Kumar Singh*	Associate Professor In The Department Of Prosthodontics And Oral Implantology ESIC Dental College & Hospital, Dr. Kn Katju Marg, Sector 15a, Rohini, Delhi – 110089. *Corresponding Author
Dr. Suyog Pradhan	Associate Professor In The Department Of Prosthodontics And Oral Implantology ESIC Dental College & Hospital, Dr. Kn Katju Marg, Sector 15a, Rohini, Delhi -110089

ABSTRACT Prosthodontics, a critical branch of dentistry, focuses on restoring and maintaining oral function, comfort, aesthetics, and health through the restoration of natural teeth and the replacement of missing teeth with artificial substitutes. This study aims to evaluate the prosthodontic techniques and materials used by private dental practitioners in Ghaziabad, Uttar Pradesh, India, and to compare these practices with the standardized curriculum prescribed by the Dental Council of India (DCI). A survey comprising 37 questions was conducted among 141 dental professionals, including general practitioners and specialists, to gather data on their prosthodontic practices. The findings reveal a significant variation in the techniques and materials used, highlighting a gap between academic training and clinical practice. Discrepancies were observed in infection control practices, denture fabrication methods, and the adoption of digital technologies. These insights underscore the need for standardized guidelines, enhanced training, and continuing education programs to improve the quality of prosthodontic care. The study emphasizes the importance of adhering to established protocols and methods to ensure optimal patient outcomes and recommends targeted improvements in prosthodontic education and practice.

KEYWORDS : Prosthodontics, dental restoration, oral health, dental techniques, prosthetic materials, dental education, infection control, digital dentistry, clinical practice.

INTRODUCTION

Prosthodontics is defined as the branch of dentistry pertaining to the restoration and maintenance of oral function, comfort, appearance and health of the patient by the restoration of the natural teeth and / or replacement of missing teeth with artificial substitutes.¹ It is that branch of dentistry which is extremely technique sensitive pertaining to the oral rehabilitation of the patient. The provision of prosthodontic services is determined by various factors: social & demographic characters, anticipated need for care by patient's symptoms & esthetic concern.² The practitioner should know about the techniques, biocompatibility and bioacceptability of the material used for the fabrication of prosthesis which has to be implemented on the patient. It is wisely said that "It is more important to preserve what already exists than to replace what is missing".³

Loss of tooth or damaged tooth structure often occurs due to dental caries, periodontal problems or trauma, which can affect esthetics & function of the remaining dentition.⁴ Despite advances in preventive dentistry, edentulism is still a major public health problem worldwide.⁵ The prevalence of edentulism varies widely across regions and countries,⁶ as well as over time and with respect to age differences.⁷ Age, educational level and socioeconomic status playing a vital role in toothlessness and denture demand.⁸ Tooth loss constitutes a final common pathway for most dental diseases and conditions. It can lead to substantial impact on quality of life.⁷ Naturally, to prevent some of these decrements in oral health-related quality of life, dentists frequently recommend various prosthetic replacements such as CD's, RPD's, FPD's and various maxillofacial prosthesis to restore form, function and aesthetic of the destroyed or lost dentition.⁹

Over the past few years, prosthodontics services have changed markedly due to an introduction of new materials, techniques and treatment options.¹⁰

There are various authors and textbooks describing these techniques which guide the operator and help in providing optimal care and they may have different opinion regarding each technique. In other word each dental school and teacher has a unique philosophy of imparting education to the patient. However well these techniques are taught or learned they are sometimes not carried out as they should be. According to a survey, there are differences between what is taught as accepted prosthodontic practice and what is actually practiced. Various studies have reported about the following of prosthodontic procedures

by private dental practitioners in the past.^{11,12,13,14,15}

A survey reported that there is a difference in procedures followed for between complete denture construction in dental schools as compared to and in general dental practice.¹⁵ The technique taught by different colleges for the same procedure can vary and the techniques prescribed in the textbooks for one procedure can also have difference of approach. For this survey the standardized syllabus prescribed by the Dental Council of India (DCI) is taken as the benchmark and we have accepted that all the dental graduates are fully acquainted with the ideal prosthodontic procedures as they have passed from recognized dental colleges. There is not enough information available regarding the various techniques utilized by general practitioners and whether there is any standardization of techniques practiced in the available literature.

The main purpose of this survey was to gather data and information about the current prosthodontic practice (types of materials and techniques) performed by dentists in Ghaziabad, Uttar Pradesh, India. It aims to raise awareness about their dental knowledge and the need for accurate dental treatment to achieve acceptable results in their practice. In addition, it attempts to recognize the problems encountered by dental practitioners in various prosthodontics treatments. Moreover, this study aims to compare dental school curriculums and techniques with the clinical practices of their students. The data could direct and support tutors in designing effective education courses and prosthodontic curriculums. The information from the survey can also be used by the IDA (Indian Dental Association) to assist with development of activities to enhance & encourage dentists to consider the specialized procedures of prosthodontics.

MATERIALS AND METHOD

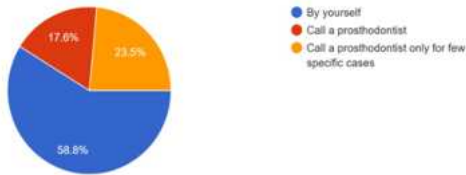
A survey was planned to determine the prosthodontic techniques used by private dental practitioners in Ghaziabad, Uttar Pradesh, India. An English-language questionnaire was created online (docs.google.com) to gather information about the use of prosthodontic techniques by dental professionals. The participants in the survey included both general dental practitioners and specialists. The questionnaire consisted of 37 questions. The URLs for the questionnaire were created and shared in the Indian Dental Association - Ghaziabad messaging group and 141 participants responded to the questionnaire. The results were analyzed, with percentage evaluations conducted. Subsequently, statistical analysis was performed and graphs and pie

charts were prepared to present the findings.

RESULT

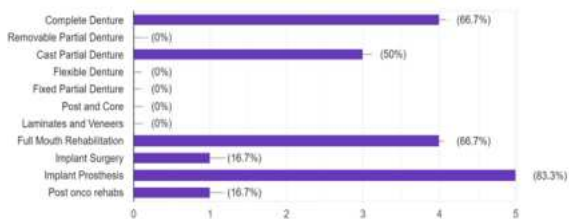
The current prosthodontic practice in various dental clinics in Ghaziabad city reveals that 58.8% of participating dentists handle prosthetic patients independently, while the remaining 17.6% consult a prosthodontist as needed.

How do you treat the prosthodontic patients in your clinic?



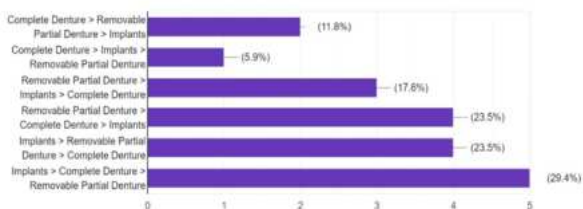
66.7% of dentists in Ghaziabad city consult a prosthodontist for fabricating complete dentures, 50% for cast partial dentures, 66.7% for full mouth rehabilitation, 16.7% for implant surgery, 83.3% for implant prosthesis and 16.7% for post-oncology rehabilitation.

If you consult a prosthodontist for cases please provide details. If no, please skip to the next question.



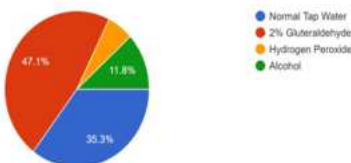
After fixed partial dentures, the highest number of patients seeking prosthodontic treatment opt for implants, followed by complete dentures and removable partial dentures.

Maximum number of patients in your clinic for prosthodontic treatment?



Only 47.1% of dentists use 2% glutaraldehyde for disinfecting impressions, while 35.3% use normal tap water and 11.8% use alcohol.

Which material you use to disinfect the impression?



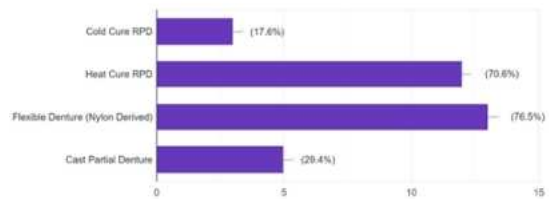
All clinicians send their patients' work to the dental technician.

The laboratory work for the prosthodontic patients are done by



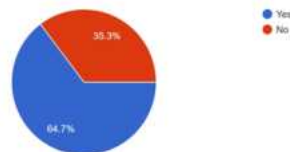
76.5% of practitioners fabricate flexible dentures, while 70.6% create heat-cured RPDs. Additionally, 29.4% produce cast partial dentures and 17.6% fabricate cold-cured RPDs.

Which type of removable partial denture you fabricate?

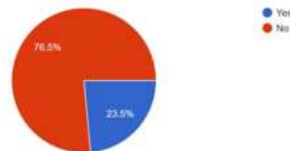


Although 64.7% of practitioners are aware of BPS dentures, only 23.5% have actually delivered them to patients.

Do you know about BPS Denture?



Have you delivered BPS Denture to a patient?



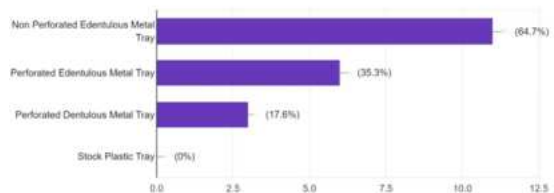
Only 17.6% of practicing dentists have fabricated complete dentures using CAD/CAM technology.

Do you fabricate complete dentures using CAD/CAM technology?



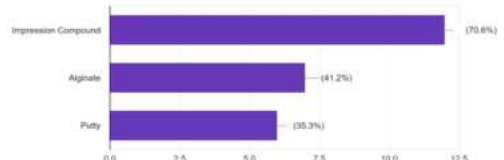
For primary impressions in complete dentures, 64.7% of respondents use non-perforated edentulous metal trays, 35.3% use perforated edentulous metal trays and 17.6% use perforated dentulous metal trays.

What type of tray do you prefer for primary impression in complete denture?



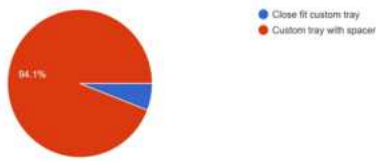
The majority of practitioners (70.6%) selected impression compound, followed by alginate at 41.2% and 35.3% use putty for recording primary impression in complete denture.

Which impression material do you use for primary impression in complete denture?



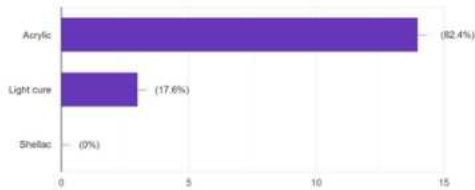
Most clinicians (94.1%) use a custom tray with a spacer to register the final impression for complete dentures.

Which type of custom tray do you use to register final impression for complete denture?



Most dentists (82.4%) use acrylic custom trays to register the final impression for complete dentures, while 17.6% use light-cured custom trays.

Which type of custom tray material do you use to register final impression for complete denture?



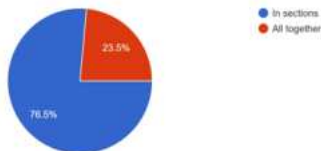
Only 11.8% of clinicians do not incorporate tissue stops.

Do you include tissue stops in custom tray?



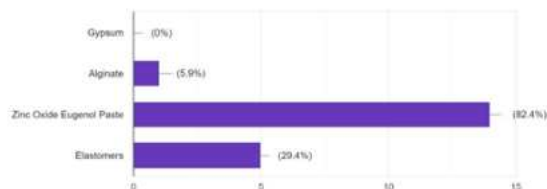
76.5% of clinicians perform border molding in sections.

How do you carry out border moulding?



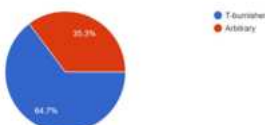
The majority of prosthodontists used zinc oxide eugenol impression paste (82.4%) for final impressions in complete dentures, while elastomers were used by 29.4% and alginate by 5.9%.

Which material do you use for making the final impression in complete denture?

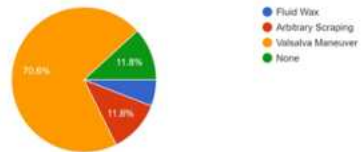


Few practitioners use the authentic techniques for measuring depth and locating the PPS on the final impression, with 64.7% using the T-burnisher technique and 25.3% using the Valsalva maneuver technique respectively.

Which technique do you use for measuring depth of posterior palatal seal in final impression?

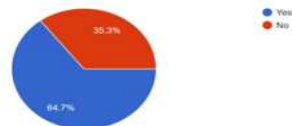


Which technique do you use to record the posterior palatal seal?



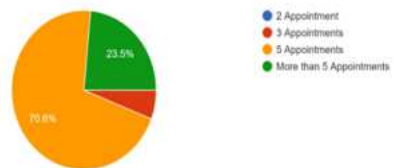
Only 64.7% of participating dentists use a face-bow for orienting jaw relations.

Do you use the face-bow for orientation jaw relation?



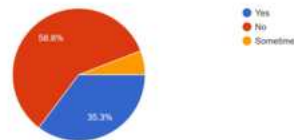
Most dentists (70.6%) deliver complete dentures to patients in 5 appointments.

In how many appointments you deliver the complete denture to the patient?

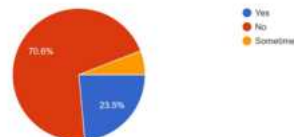


Only 35.3% of dentists encounter issues when delivering complete dentures, while 23.5% face challenges with removable partial dentures.

Do you face any issue while delivering the complete denture?

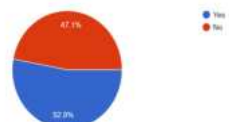


Do you face any issue while delivering the removable partial denture?



52.9% of practitioners use gingival retraction cord before making the final impression for fixed partial dentures.

Do you use retraction cord for gingival retraction before making the final impression for FPD?



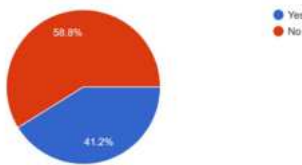
76.5% of clinicians use modelling wax for interocclusal records, while 29.4% uses polyvinylsiloxane bite registration paste and 5.9% uses alu wax.

Which type of material do you choose for interocclusal record?



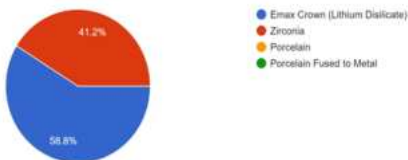
58.8% of dentists prefer not to provide a provisional crown after completing the preparation.

Do you give provisional or temporary crown or bridge after finishing the preparation?



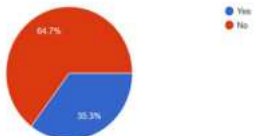
58.8% of dentists prefer Emax crowns for the anterior region.

Which type of crown you advice for anterior region in patient mouth?



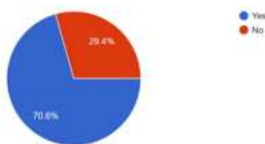
Only 35.3% of dentists prepare custom posts for their patients.

Do you make custom posts for you patient?



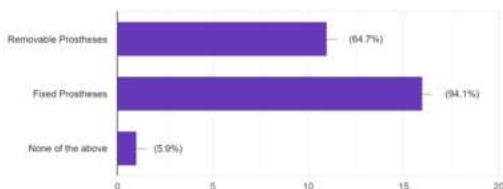
Approximately 70.6% of practicing dentists prefer using study models before starting fixed partial denture treatment.

Do you prefer study models before commencing fixed prosthodontic treatment?



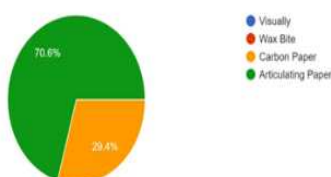
94.1% of dentists perform shade matching for fixed dental prostheses, whereas 64.7% do so for removable prostheses.

Do you practice shade matching for your prostheses?



70.6% of dentists use articulating paper to check high points in crowns, while 29.4% prefer carbon paper.

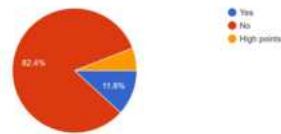
How do you check for high points in the crown?



Only 11.8% of dentists encounter issues when delivering fixed partial dentures.

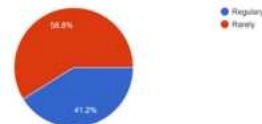
Only 41.2% of dentists encounter full mouth rehabilitation patients in their clinical practice.

Do you face any issue while delivering the fixed partial denture?



52.9% of dentists practice implant dentistry in their clinics.

How often do you encounter full mouth rehabilitation patients in your clinic?



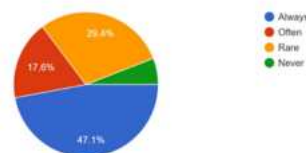
47.1% of dentists obtain written consent from patients before starting a procedure, while 29.4% do so rarely.

Do you practice implant dentistry in your clinic?



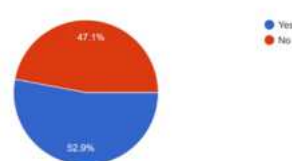
52.9% of dentists practice digital dentistry, while 47.1% do not.

Do you obtain written consent from the patients before starting the procedure?



All dentists (100%) have a RVG setup in their clinics, 80% have an intraoral camera, 20% have an intraoral scanner and 10% have a CBCT unit.

Do you practice digital dentistry in your dental clinic?



56.3% are aware of the use of artificial intelligence in the field of dentistry.

Do you practice digital dentistry in your dental clinic? If Yes, please mention which all machinery you have in your clinical set-up. If no, please skip to the next question.



DISCUSSION

According to the DCI syllabus for recognized dental colleges in India, undergraduate students dedicate over 30% of their academic career to developing skills in prosthodontics. This training spans from the first year to the final year, encompassing various aspects of prosthodontics. Although students receive a comprehensive theoretical education in

prosthodontics, their clinical training primarily focuses on removable prosthodontics, such as conventional removable complete dentures and removable acrylic partial dentures.

Given the multiple techniques available for performing procedures in prosthodontics, no single universally accepted standard technique exists. Literature indicates discrepancies between the prosthodontic techniques taught in dental colleges and those practiced in private settings. Various authors and textbooks outline different prosthodontic techniques, all of which are widely recognize

The analysis of prosthodontic practices among private practitioners in Ghaziabad provides significant insights into the current landscape of dental care in the region. The findings reveal a dichotomy between traditional and modern practices, highlighting areas where advancements have been embraced and others where further improvement is needed.

A substantial proportion of dentists (58%) manage prosthetic cases independently, suggesting a high level of confidence and self-sufficiency among practitioners. This is complemented by the fact that 17% consult prosthodontists for specific cases, such as complete dentures (66.7%), cast partial dentures (50%), and full mouth rehabilitation (66.7%).¹⁶ The high rate of consultation for implant prostheses (83.3%) reflects the specialized nature of implantology, which often requires advanced skills and knowledge.

Disinfection practices among practitioners show significant variation, with only 47.1% using 2% glutaraldehyde, a standard disinfectant. The reliance on tap water (35.3%) and alcohol (11.8%) by a considerable number of practitioners points to a lack of uniformity in infection control protocols. This inconsistency could impact patient safety and highlights the need for standardized guidelines and better training in disinfection techniques.¹⁷

In terms of denture fabrication, flexible dentures are the most commonly produced (76.5%), followed by heat-cured removable partial dentures (RPDs) at 70.6%. The lower adoption rates for cold-cured RPDs (17.6%) and cast partial dentures (29.4%) may be attributed to the perceived benefits of flexible and heat-cured options, such as comfort and durability. Despite a reasonable level of awareness (64.7%) about Biofunctional Prosthetic System (BPS) dentures, only 35.3% have actually delivered them, indicating potential barriers such as cost, material availability, or lack of familiarity with the technique.¹⁸ The use of CAD/CAM technology for fabricating complete dentures is still limited (17.6%), which is consistent with findings from other studies suggesting slow adoption of digital technologies in prosthodontics in developing regions.¹⁶ This slow uptake could be due to high costs, the need for specialized training and the initial resistance to change from conventional methods.

Impression techniques also show a mix of traditional and contemporary practices. While 94.1% of practitioners use custom trays with spacers and 70.6% use impression compound for final impressions, fewer employ modern techniques like face-bows (64.7%) for orienting jaw relations or border moulding in sections (76.5%). This combination of methods reflects a transitional phase where practitioners are integrating new techniques with established practices.¹⁸

Patient care challenges appear to be relatively manageable, with only 35.3% of dentists reporting issues with complete dentures and 23.5% facing challenges with removable partial dentures. The decision of 58.8% of dentists to avoid providing provisional crowns after preparation might affect patient satisfaction and treatment outcomes, highlighting an area for potential improvement. Additionally, the preference for Emax crowns in the anterior region (58.8%) suggests a focus on aesthetic outcomes, likely driven by patient demand and material properties.¹⁷

The adoption of digital dentistry tools is notable, with universal use of RVG setups and significant use of intraoral cameras (80%) and scanners (20%). However, the limited presence of CBCT units (10%) and the awareness of artificial intelligence in dentistry (56.3%) indicate an uneven adoption of advanced technologies. These findings suggest a growing but still evolving integration of digital tools in clinical practice.¹⁸

CONCLUSION

In conclusion, the prosthodontic practices among private practitioners in Ghaziabad reflect a mix of traditional methods and newer technologies. Practitioners exhibit a high degree of autonomy and confidence in managing prosthetic cases, yet they also frequently consult specialists for more complex procedures. The diversity in disinfection practices and the gradual adoption of advanced technologies like CAD/CAM and CBCT indicate areas where additional training and standardization could significantly enhance patient care.

These insights highlight the need for targeted improvements in prosthodontic practices, which could inform future educational and policy initiatives in the region. The sample of private dental practitioners offers a valuable perspective on the various prosthodontic techniques they use and the challenges they encounter in treating prosthodontic patients.

To fabricate an ideal prosthesis, it is essential for practitioners to adhere to the protocols and methods outlined in standard textbooks, as referenced by various authors and taught in the undergraduate curriculum. This points to a potential disconnect between the undergraduate prosthodontic curriculum and general dental practice. Continuing dental education programs that emphasize the risks of shortcuts and reinforce the importance of following prescribed techniques can improve practitioners' clinical effectiveness and the quality of patient care. It is also crucial to underscore the fundamental principles of prosthodontics in the undergraduate teaching curriculum to bridge this gap.

REFERENCES

1. Singh G, Kapoor V, Gambhir R, Bansal V. Application Of Prosthodontic Techniques By Private Practitioners In Northern India- A Survey. *Int J Epidemiol* 2010;9(2):1-7.
2. Al-Kaisy N. A Survey of Prosthodontics Techniques Applied by Dental Practitioners in Sulaimani City. *J Bagh Coll Dent* 2016;28(3):22-9.
3. Olin PS, Clay JD, Look JO. Current prosthodontic practice: A dental laboratory survey. *J Prosthet Dent* 1989;61(6):742-5.
4. Rosenstiel SF, Land MF, Fujimoto J. *Contemporary Fixed Prosthodontics*. 3rd ed. St Louis: Mosby; 2001.
5. Emami E, de Souza RF, Kabawat M, Feine JS. The impact of edentulism on oral and general health. *Int J Dent* 2013; 498305.
6. Petersen PE, Bourgeois D, Ogawa H, Estupinan-Day S, Ndiaye C. The global burden of oral diseases and risks to oral health. *Bull World Health Organ* 2005; 83: 661-9.
7. Mojon P. The world without teeth: demographic trends. In: Feine JS CG, editor. *Implant overdentures: The standard of care for edentulous patients*. Chicago: Quintessence; 2003. P.3-14.
8. Al Hamdan E, Fahmy MM. Socioeconomic factors and complete edentulism for female patients at King Saud University, Riyadh, Saudi Arabia. *Tanta Dent J* 2014; 11:169-73.
9. Öwall, Bengt, Arnd F. Käyser, and Gunnar E. Carlsson. *Prosthodontics: Principles and Management Strategies*. London: Mosby-Wolf; 1996. P.35-48.
10. Manski RJ, Goodman HS, Reid BC, Macek MD. Dental Insurance Visits and Expenditures among Older Adults. *Am J Public Health* 2004; 94:759-64.
11. Hyde PT, Mc Cord JF. Survey of Prosthodontic impression procedures for complete dentures in general dental practice in the United Kingdom. *Journal of Prosthetic Dentistry* 1999; 81: 295-299.
12. Jagers JH, Javid NS, Colaizzi FA. Complete denture curriculum survey of dental schools in the United States. *Journal of Prosthetic Dentistry* 1985; 53(5): 736-739.
13. Mendes AJ. Application of prosthodontic techniques in private practice. *Journal of Prosthetic Dentistry* 1985; 54(5): 730-735.
14. Murphy WM, Bates JF, Huggett R. Complete denture construction in general dental practice: A Survey. *British Dental Journal* 1971; 130: 514-521.
15. Murphy WM, Bates JF, Stafford GD. Complete denture construction in dental schools and hospitals of the United Kingdom and Ireland. A survey. *British Dental Journal* 1972; 133: 179-184.
16. Al-Harbi, F., et al. (2018). Digital Technologies in Prosthodontics: A Review. *Journal of Prosthetic Dentistry*, 120(4), 500-510.
17. Kumar, A., et al. (2020). Current Trends in Prosthodontic Practices in India: A National Survey. *Indian Journal of Dental Research*, 31(2), 243-251.
18. Singh, R., & Gupta, V. (2019). Adoption of Digital Technology in Prosthodontics: An Overview. *Journal of Prosthodontic Research*, 63(3), 325-331.