

Impression Materials And Techniques Used For Complete Denture Fabrication Amongst General Practitioners- A Survey In And Around Chengalpet District

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Abstract:- Aim: The aim of this article is to conduct a questionnaire based survey on the numerous impression materials and techniques used for complete denture fabrication amongst general practitioners in and around Chengalpet district. **Materials and Methods:** A survey questionnaire was prepared and distributed randomly to 50 practitioners in Chengalpet district irrespective of their field of specialization. The survey included a set of 11 questions regarding the choice of impression materials and techniques for complete denture fabrication. Each respondent was allowed to choose only one option from the given set of answers. **Result:** Irreversible hydrocolloid was the most commonly used material for primary impressions. Most practitioners adopted the selective pressure theory while making the impressions. Majority of the practitioners used a spacer covering only the secondary stress bearing and relief areas. The thickness of the spacer was decided based on the amount of relief by most dentists. A spacer was used along with light body polyvinylsiloxane impression material by the majority. Green stick compound is the material of choice for border molding the custom tray. Polyvinylsiloxane has taken over eugenol pastes as the material for making final impressions. Consideration for excessive movable tissue is provided by making relief holes. The cost of the material did not significantly influence the choice of material.

Keywords: Impression materials, Technique, spacer design

INTRODUCTION

Perfect impression procedure is necessary to get good retention and peripheral seal and provides support and stability for complete denture^[1,2]. Ideally, the established borders of final impression should be similar in thickness and length to denture flanges^[1,3]. Following the predefined progressive steps make sure a successful complete denture^[3,6,5]. These include primary impression, custom tray fabrication, border molding, and final impression. Techniques of Impression making had developed with the establishment of new material and techniques, nowadays. A wide range of materials and techniques are available for many clinical

situations which mandate the complete understanding of impression concepts and principles. In spite of the advances, material choice usually relies on personal preference and experience.

This current study aimed to identify choice of impression materials and techniques used for complete denture fabrication amongst general practitioner including Prosthodontists in and around Chengalpet district.

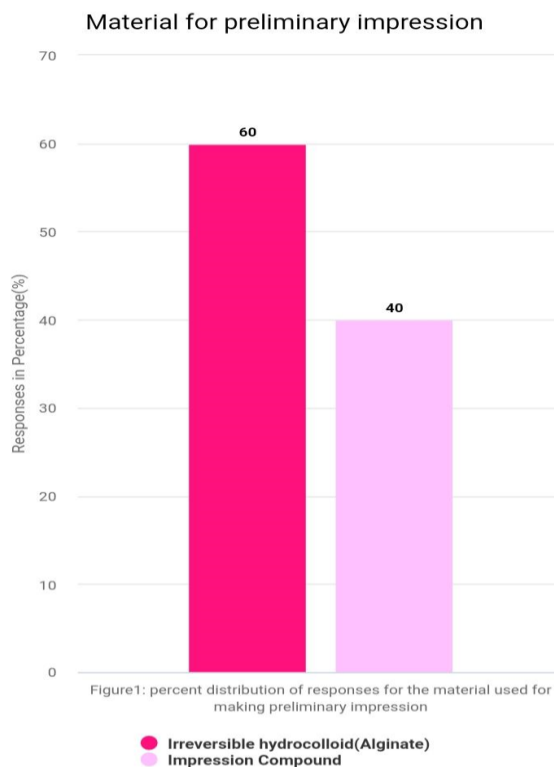
Materials and methods

A survey questionnaire was prepared and circulated to the general practitioners including the Prosthodontist in chengalpet district.

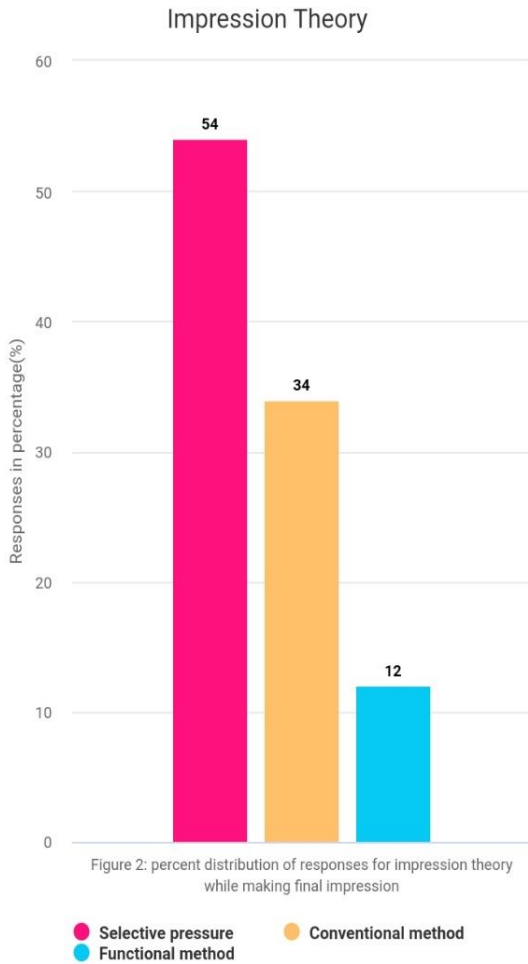
The survey comprised of two sections. In the first section, focus was on the type of impression material used during the primary and secondary impressions which include elastic and inelastic impression materials. The second section focused on techniques employed in fabrication of final impression and the spacer designs that will be used in final impression procedures. The questionnaire was prepared based on the survey which included 11 multiple choice questions which was circulated to the respondents. Every respondent were allowed to choose only one option for each question. The response from the respondents were kept confidential throughout the survey. The results were calculated based on the response received and it was converted to percentage distribution.

RESULTS

It was ensured that all 50 questionnaires were filled with no question left unanswered. (All percentages in the article have been rounded to the nearest whole number). With regards to the choice of material used for making preliminary impression, 30 respondents (60%) indicated the use of irreversible hydrocolloid (alginate) and 20 (40%) still preferred using impression compound (figure1).

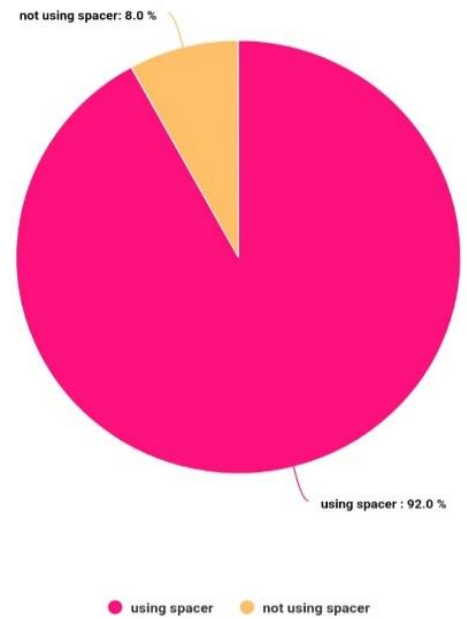


27 respondents (54%) use selective pressure technique while making the final impression, while 17 of them (34%) use the conventional method and 6 respondents (12%) use the mucocompressive or functional method (figure2).



A majority of the practitioners 46(92%), used a spacer in the design of the custom tray and the rest did not use a spacer (figure3).

Figure 3: percent distribution for using spacer design in the custom tray



Among the ones that use a spacer, 29 of them (58%) use a spacer covering only the secondary stress bearing and relief areas, 11 respondents (22%) use full spacer not covering the major stress areas with additional relief if required and 10 of them (20%) use a full spacer with tissue stops and additional relief (figure 4).

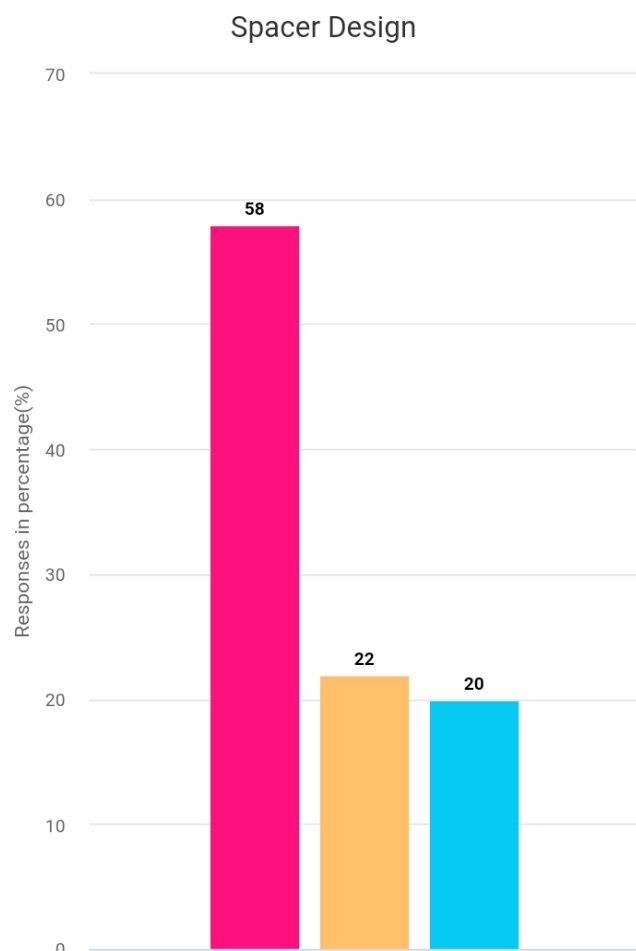


Figure4: percent distribution of responses for spacer design

- use a spacer covering only the secondary stress bearing and r...
- use full spacer not covering the major stress areas with additio...
- use a full spacer with tissue stops and additional relief .

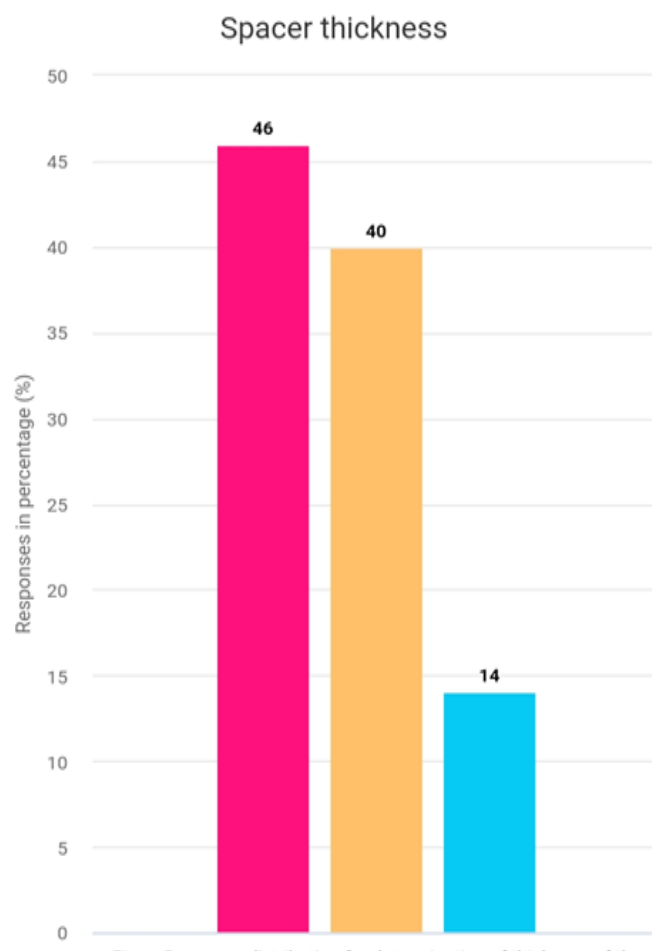
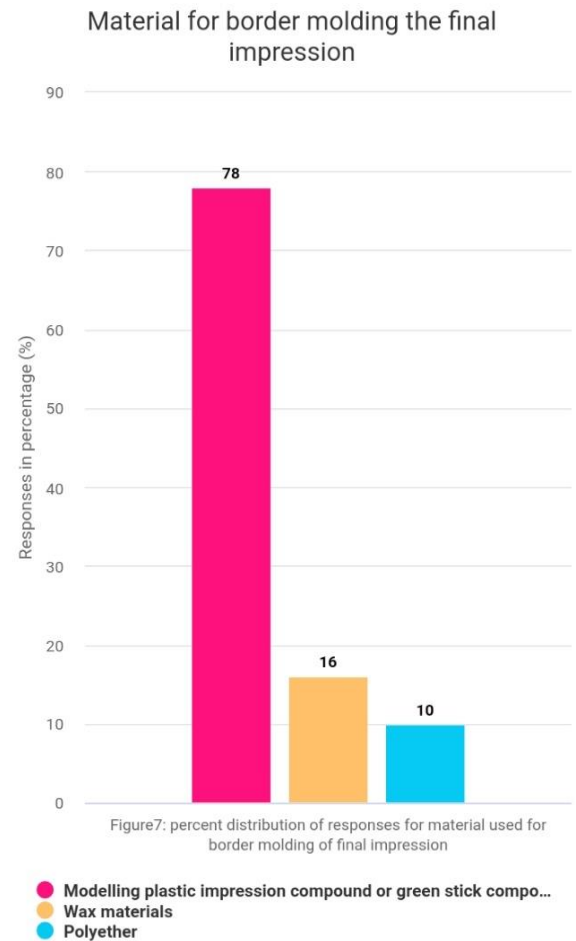
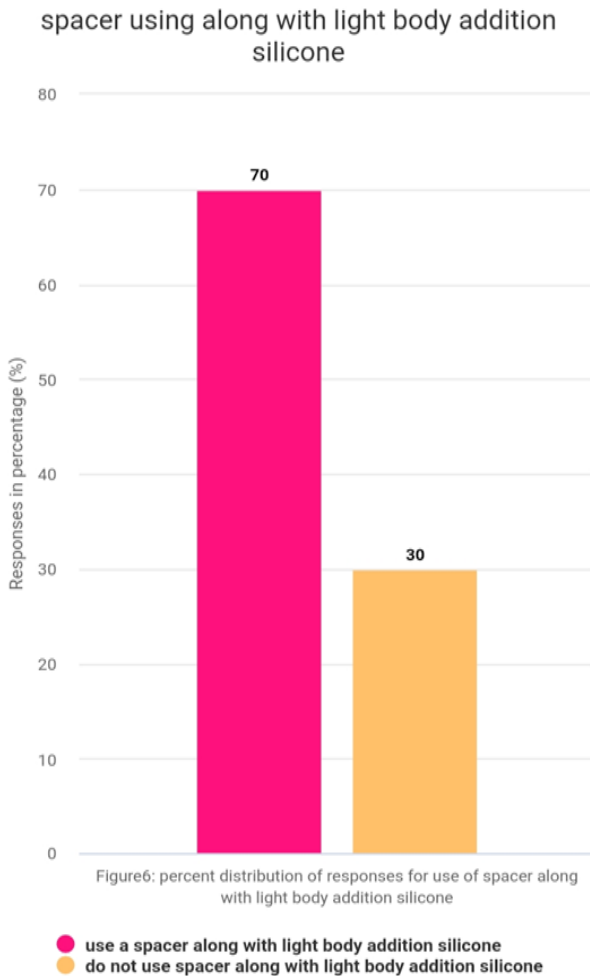


Figure5: percent distribution for determination of thickness of the spacer

- Based on the amount of relief
- Arbitrary Regardless of Impression Material Used
- type of impression material used

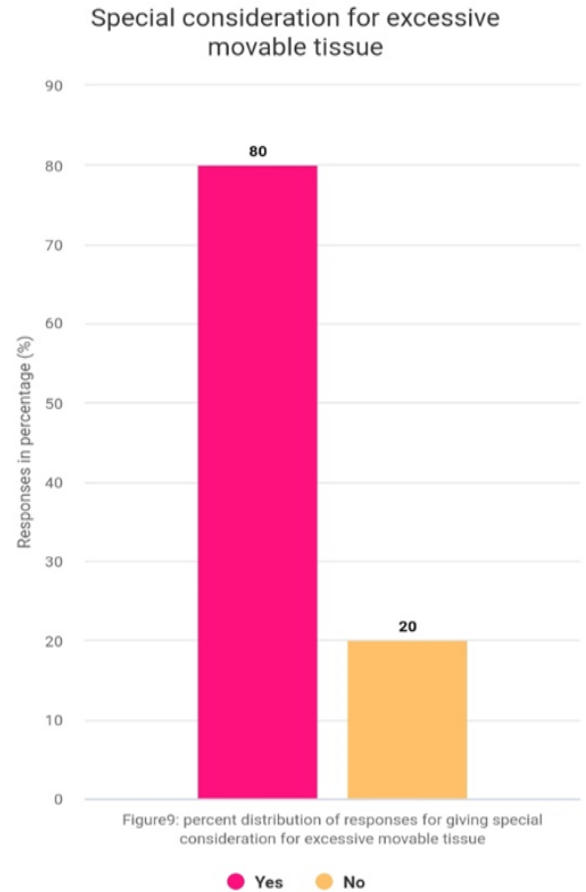
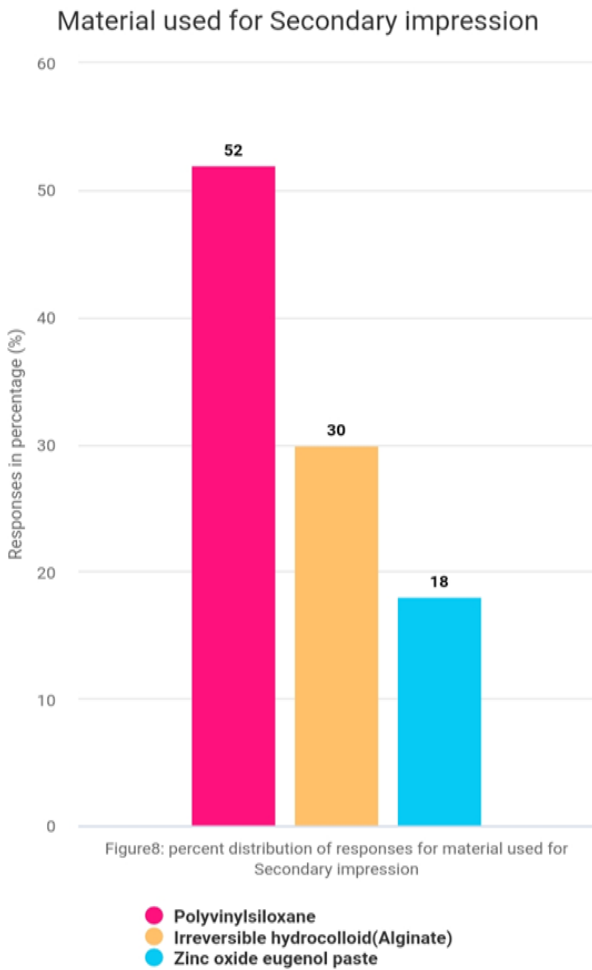
The thickness of the spacer was decided based on the amount of relief by 23 (46%) respondents. 20 of them (40%) decided it arbitrarily whereas 7 of them (14%) correlated the thickness of the spacer with the type of impression material used (figure 5).

A majority of the respondents 35(70%), use a spacer along with light body addition silicone while the rest of them, 15(30%) do not use it (figure 6).



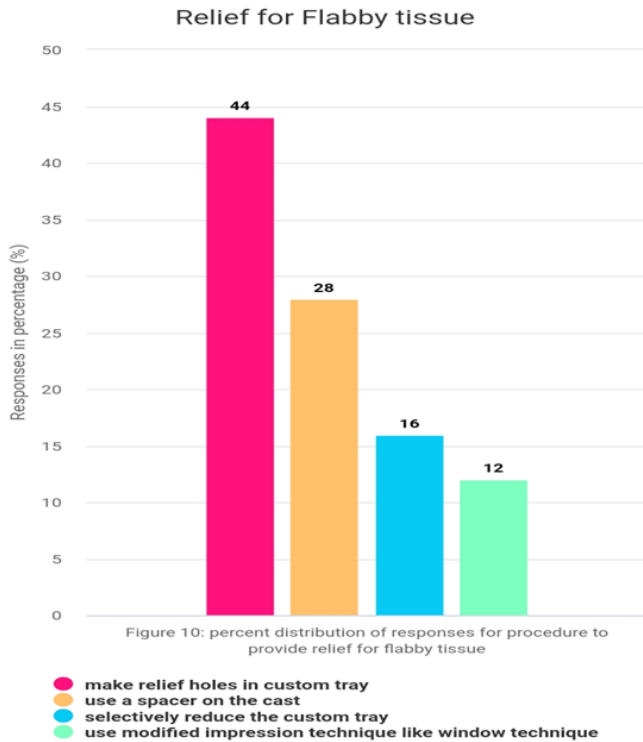
It was found that most respondents border molded the custom tray prior to making the final impression. 39 respondents (78%) use modelling plastic impression compound or green stick compound for border molding, 8 of them (16%) use wax materials and 5 of them (10%) use polyether (figure 7).

With regards to the material used for making secondary impression, 26 respondents (52%) used polyvinylsiloxane, 15 respondents (30%) used irreversible hydrocolloid (alginate) and 9 of them (18%) used zinc oxide eugenol paste (figure8).



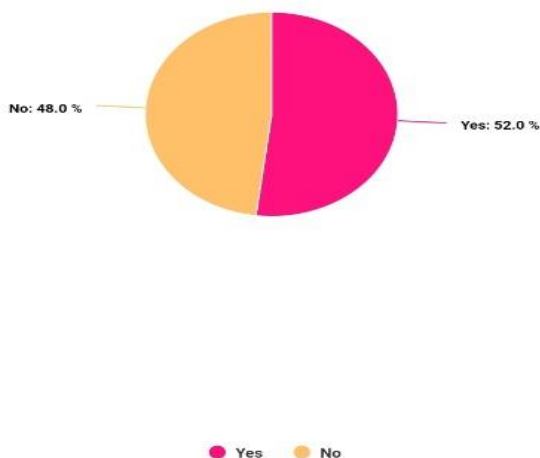
Majority of the respondents 40 (80%) gave special consideration for excessively movable tissue (figure9).

22 of them (44%) made relief holes in the custom tray, 14 of them (28%) used a spacer on the cast, 8 respondents (16%) selectively reduced the custom tray and 6 of them (12%) used modified impression techniques like window technique (figure 10).



The cost of the material seemed to influence the choice of impression material for 24 respondents (48%) (figure 11).

Figure 11: percent distribution of responses for influence of cost of material on choice



DISCUSSION

The Dental Surgeons participating in the survey correspond to different specialities and performed impression making as a part of their treatment plan at some point or another. With differing period of experience, the dentists were able to give their personal opinion regarding each and every question, thus providing better awareness into the subject.

The most commonly used primary impression material in this survey was irreversible hydrocolloid (60%), impression compound being used only by 40% of the respondents. This is in confirmation of the survey conducted by Rupal *et al* [7] and Kakatkar[8] where they described that impression compound was used by maximum of the practitioners in India. Although a study conducted by Singh G *et al* [9] in four major Indian cities revealed that alginate was used by 71% of the practitioners. Surveys conducted in United Kingdom[10] and U.S Dental schools[11] have also reported alginate to be the material of choice for making primary impressions.

Most of the practitioners (54%) used selective pressure technique for making the final impression followed by 34% of the respondents using the conventional method. This is in agreement with previous surveys conducted in India and other countries [7,12,13]. Selective pressure technique makes it possible to confine the forces to the stress bearing areas and the non-stress bearing areas

In this survey, 92% of the respondents recommend the use of a spacer in the design of a custom tray and a spacer covering only the secondary stress bearing and relief areas is used by the majority (58%). Previous surveys conducted to analyse the design of spacer used have also shown same results.

Respondents were also asked the criteria used to decide the thickness of the spacer. Most of them (46%) decided the thickness based on the amount of relief, the rest made the decision arbitrarily (40%) or based on the choice of impression material (14%). In a survey of U.S dental schools, majority of them (45%) used a layer of base plate wax for relief [12]. A. Roy Macgregor recommends the following thicknesses of the spacer based on the impression material used: 2.5mm for impression plaster, 0.5 mm for zinc-oxide eugenol paste, 2mm for alginate and 1.3-3mm for elastomeric impression materials [14]. 66% of the respondents used a spacer when using light body addition silicone as the impression material of choice. This is in agreement with the fact that some amount of tissue compression occurs when using elastomeric impression materials [15].

Modelling plastic impression compound is the most popularly used material (78%) due to its low cost, dimensional stability, little material wastage, long shelf life, ability to be added in increments and ease of adaptation.

Surveys conducted by U.S school have indicated a increased trend of the use of elastomeric materials for border molding[16]. The advantage of using elastomeric impression materials is that it is less time consuming and all borders can be recorded simultaneously. A clear majority (52%) use polyvinylsiloxane as the material of choice for making the final impression. This is in contrast to previous surveys conducted in India where Zinc-Oxide Eugenol pastes were more commonly used [7,8]. The advantage of using elastomeric impression materials like PVS and polysulfides is their ease of handling and manipulation, dimensional stability, adequate working and setting time and improvement in overall properties. The main disadvantage of Zinc-Oxide Eugenol pastes is that it is inelastic, sticks to skin and mucosa and causes a burning sensation.

A special consideration to excessive movable flabby tissue was made by 80% of the respondent, with majority of them (44%) preferring to place relief holes. This is contrast to a previous survey by Mehra *et al* [17] where majority of them used the window technique i.e modified impression technique.

The cost of material often influences the choice of impression material. 48% of the respondents considered the cost of the material before using a material. No significant correlation has been made between the cost of the material and choice of material in previous surveys.

CONCLUSION:

This study explained the current trends regarding impression materials and techniques for complete denture fabrication amongst general practitioners in and around Chengalpet district.

Based on the results of the study and within its limitations, the following conclusions can be drawn.

- Majority of the respondents used Irreversible hydrocolloid impression material for preliminary impressions.
- Most of the practitioners preferred the selective pressure theory during making the impressions.
- Maximum of the practitioners use a spacer covering only the secondary stress bearing and relief areas.
- A large number of practitioners decided the thickness of the spacer based on the amount of relief.
- Most of the dentists used a spacer along with light body addition silicone.
- Vast majority of practitioners selected low fusing modelling plastic for border molding the custom tray.
- Most of the dentists used polyvinylsiloxane as the material for making final impressions.
- Most of practitioners followed the principles of mucostatic impression wherever excessively mobile tissues were found.
- The cost of the material does not significantly influence the choice of material.

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REFERENCES

1. Carlsson G. Facts and fallacies: an evidence base for complete dentures. *Dent Updat* [Internet]. 2006;33(3):134–42.
2. Hyde TP, Craddock HL, Gray JC, Pavitt SH, Hulme C, Godfrey M, et al. A Randomised Controlled Trial of complete denture impression materials. *J Dent* [Internet]. 2014;42(8):895–901.
3. Petropoulos VC, Rashedi B. Current concepts and techniques in complete denture final impression procedures *JProsthodont*. 2003;12(4):280–7.

4. Chaffee NR, Cooper LF F DA. A technique for border molding edentulous impressions using vinyl polysiloxane material. *Prosthodont*. 1999;8(129-134).
5. Hyde TP, Craddock HL, Blance A, Brunton PA. A cross-over Randomised Controlled trial of selective pressure impressions for lower complete dentures. *J Dent*.010;38(11):853–8.
6. Kawai Y, Murakami H, Shariati B, Klemetti E, Blomfield J V., Billette L, et al. Do traditional techniques produce better conventional complete dentures than simplified techniques? *J Dent*.2005;33(8):659–68.
7. Rupal J. Shah *et al.* Complete Denture Impression Procedures and Techniques Practiced by Dentists across the State of Gujarat: A Survey, *IOSR-JDMS*, 14(6), 2015, 1-11.
8. Kakatkar VR. Complete denture impression techniques practiced by private dental practitioners: a survey, *J Indian Prosthodont Soc*, 13(3), 2013, 233-235.
9. Singh G *et al.* Application of prosthodontic techniques by private practitioners in Northern India— a survey, *Internet Journal of Epidemiology*, 9(2), 2010.
10. Hyde TP *et al.* Survey of prosthodontic impression procedures for complete dentures in general dental practice in the United Kingdom, *J Prosthet Dent*, 81(3), 1999, 295-299.
11. Jagers JH *et al.* Complete denture curriculum survey of dental schools in the United States, *J Prosthet Dent*, 53(5), 1985; 736-739
12. Petropoulos VC *et al.* Complete denture education in U.S. dental schools, *J Prosthodont*, 14(3), 2005, 191-197.
13. Al-Ahmar AO *et al.* Quality of master impressions and related materials for fabrication of complete dentures in the UK, *J Oral Rehabil*, 35(2), 2008, 111–115.
14. MacGregor A. Roy, Fenn, Liddelow and Gimson's clinical dental prosthetics, 3rd ed. (London: Wright, 1989) 43-78.
15. Shetty S *et al.* The selective pressure maxillary impression: A review of the techniques and presentation of an alternate custom tray design, *J Indian Prosthodont Soc*, 7(1), 2007, 8-11.
16. Petrie CS *et al.* A survey of U.S. prosthodontists and dental schools on the current materials and methods for final impressions for complete denture prosthodontics, *J Prosthodont*, 14(4), 2005, 253-62.

Conflict of interest: Nil