



Knowledge And Attitude Of Dental Practitioners On The Use Of Denture Adhesives: A Questionnaire Survey

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Abstract:

The study's goal was to investigate dentists' knowledge and attitudes about denture adhesives. Denture adhesives and their role in prosthodontics are particularly important because they benefit both dental professionals and patients. A total of 380 dentists participated in the study, which was conducted among several dentists and dental graduates in Tamil Nadu. The awareness and attitude among dentists towards denture adhesive and its toxicity were checked through a questionnaire. The results of this survey conclude that dental practitioners' knowledge of denture adhesive and its toxicity is limited. Probable reasons for this were a lack of awareness among prescribing dentists, a lack of education about its side effects, and patient counselling about denture usage, denture relining, and rebasing, as residual ridge resorption occurs over time and knowledge needs to be improved.

Keywords: Denture adhesives, complete dentures, toxicity, dental practitioners.

Introduction:

In this era, there are many different kinds of prostheses, which can be fixed or removable prostheses, especially in the dental field, which requires knowledge of prostheses in most cases. Modern methods like CAD-CAM and many others have evolved and are in use for the making of prostheses as desired by the patients, but not all cases have the privilege to undergo a fixed prostheses due to some reasons like financial constraints or due to any clinical conditions. As we know, many people, particularly senior citizens, always opt for removable dentures as they are cost-efficient and more economical, especially in India. But many people have a fear of dentures not fitting or falling off while they talk or eat. For such patients, it is the duty of the clinicians to provide dentures with good retention.

These complete and detachable partial dentures lose their retention with time. In these situations, fresh dentures are made and rebasted if the patients agree. Denture adhesives or fixatives are often prescribed for certain patients who have limited financial resources or who refuse to receive additional care. [1-2] A substance called a denture adhesive, fixative, or adherent is used to attach and hold complete or removable dentures in the oral mucosa's specified denture-bearing area, aiding in retention. [5,6] The majority of people use these solutions to keep their dentures in place and stable for longer. When it comes to improving the stability, function, and retention of full or removable denture wearers' prostheses, physicians have occasionally suggested these goods. However, many prosthodontists and dentists consider this to be a sign of a lack of clinical expertise. [7]

Denture adhesives boost patients' psychological confidence by enhancing denture retention, especially in their social lives, which is especially beneficial for those from low-income backgrounds who cannot afford a fixed prosthesis or the rebasing of their old dentures. [8] The toxicity of denture adhesives as well as their causes and side effects ought to have been disclosed to denture users. It is never appropriate to promote excessive denture adherents, and clear standards are needed for the best usage and maintenance instructions. [9,10] To help with retention, the prosthodontist or dentist must inform the patient about the need to replace a complete or removable denture on a regular basis. Modern denture production includes denture adhesives, which are used in both the initial and subsequent stages of the process. [11,12] This study set out to evaluate dentists' attitudes, knowledge, and awareness regarding the usage of denture adhesives in clinical dentistry in Tamil Nadu.

ture bearing area. ¹ Denture adhesives are also re-

Materials And Methods:

This questionnaire survey was carried out by establishing an online English language questionnaire on Google Forms about the use of denture adhesives by dental professionals in Tamil Nadu. The Google survey form's web URL was distributed to 500 dental professionals, including general dentists, prosthodontists, and other specialists operating as general practitioners. The form was completed by 380 dental practitioners.

The questionnaire was distributed through social media platforms like WhatsApp messages or email, and some were distributed among the dental practitioners as printed copies. The field work took place for about 3 months. The initial sample response was 457 patients who participated willingly. The data were cleaned before data entry, among which the surveys with errors in information and any possible bias were excluded.

The collected responses were scrutinized for consistency, accuracy, validity, clarity, and competence and changes were performed. The statistical analysis was done using statistical software SPSS version 22.0. Descriptive statistics and Chi-square test were done.

Result Summary:

This study gathered information from dentists in Tamil Nadu about the use of denture adhesives in clinical practice. The questionnaire obtained a 100% response rate. There were significantly more female dental practitioners (60.5 %) than male dental practitioners among all research participants from Tamil Nadu (39.5 %). 71.6 % were BDS graduates, 13.2 % were prosthodontists, and the remaining 16.1 % were MDS graduates in other specialties. Among the study participants, 21-30year old practitioners (57.9%) were the most knowledgeable about denture adhesives, while 41-50year old practitioners (8.9%) were the least knowledgeable.

When asked about the source of knowledge about denture adhesive, the majority of the research participants learned via educational seminars (62.9%) while some learned from commercial dental representatives (21.6%). Denture adhesive is used by 83.2 % of the dental practitioners who participated in this study in their clinical practise, while % use it only occasionally. Denture adhesives are recommended by the majority of 332 (87.6 %) dentists who participated in the study. About 56.6 % (215) of the participants advise their patients to utilise powder denture adhesive, 35.3 % (134) prescribe cream or pastes, and 8.2 % (31) propose adhesive strips.

Most (41.3%) dental practitioners advise their old complete denture patients with problematic support to use denture adhesives, whereas 20.3 % advises for denture without retentions and 38.4 % advises both. 65 % advise their patients to use it for 1-3 months and 23.2 % for maximum 6 months, while 76.8 % advises to use it once a day. Around 48.5 % of the research respondents agree that the more denture adhesive used, the better the retention, while 29.8 % are unsure and 21.4 % strongly disagree. 69.4 % of the dental practitioners who took part in this study were aware of the negative effects of denture adhesives. 68.1 % of the respondents claim that denture adhesives cause neurological disturbances, with 62.1 % blaming zinc content in denture adhesives.

Approximately 43 % of study participants agree that excessive use of denture adhesives causes hypozincaemia, while 23.3 % believe hypocupraemia. 44.2 % of practitioners advise their patients to avoid contact allergies before using denture adhesives, while 38.9 % warn about numbness, tingling sensations, and extremity weakness. A majority of 78.9 % of dentists advise their patients to clean their dentures after each use, to gargle after denture removal, and to visit the dentist once every 6 months.

Table 1. Distribution of subjects based on demographic details

DEMOGRAPHICS		FREQUENCY (N)	PERCENTAGE (%)
AGE	21-30	220	57.9%
	31-40	113	29.7%
	41-50	34	8.9%
	>50	13	3.4%
GENDER	Male	150	39.5%
	Female	230	60.5%
QUALIFICATION	B.D.S	272	71.6%
	M.D.S (Prosthodontics)	50	13.2%
	M.D.S (Other specialist's)	61	16.1%

Table 2: General Questions pertaining to dental caries and oral hygiene

QUESTION	OPTIONS	FREQUENCY (N)	PERCENTAGE (%)
Are you aware of the use of denture adhesives?	Fully aware	80	21.1%
	Aware	238	62.6%
	Neither aware or not aware	52	13.7%
	Not aware	6	1.6%
	Fully not aware	4	1.1%
Do you use denture adhesives in your clinical practice?	Always	25	6.6%
	Very often	114	30%

	Sometimes	177	46.6%
	Rarely	53	13.9%
	Never	11	2.9%
Do you recommend the use of denture adhesive to your patients?	Yes	333	87.6%
	No	47	12.4%
What type of denture adhesives do you recommend?	Cream/ pastes	134	35.3%
	Powder	215	56.6%
	Adhesive strips	31	8.2%
For whom do you recommend the use of denture adhesives?	Old complete denture patient with problematic support	157	41.3%
	Denture without any retention	77	20.3%
	Both	146	38.4%
For how long do you recommend the use of denture adhesives?	1-3 months maximum	247	65%
	6 months maximum	88	23.2%
	Continuously	45	11.8%
How many times did you recommend the use of denture adhesive per day?	One time	292	76.8%
	More than one time	88	23.2%
More the amount of denture adhesive used better is the retention of the denture	Strongly agree	36	9.5%
	Agree	149	39.3%
	Neither agree nor disagree	113	29.3%
	Disagree	62	16.4%
	Strongly disagree	19	5%
Are you aware that the composition of denture adhesive causes any side effects?	Fully aware	45	11.8%
	Aware	219	57.6%
	Neither aware nor not aware	75	19.7%
		40	10.5%

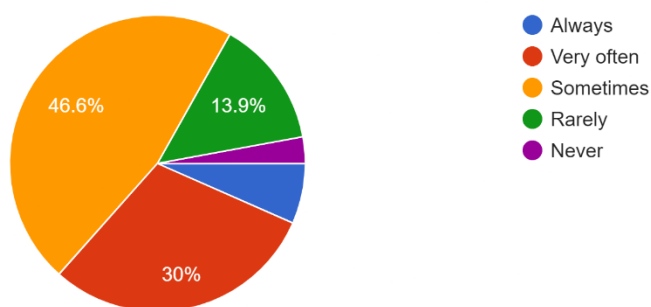
	Not aware	1	0.3%
	Fully not aware		
Which side effect is caused by denture adhesive?	Neurological disturbance	258	68.1%
	Hematological disorders	97	25.6%
	Other	24	6.3%
Do you know which component of denture adhesive cause neurological disturbance?	Zinc	234	62.1%
	Polymethyl vinyl ether	109	28.9%
	Maleic anhydride copolymer	34	9%
Excessive uses of denture adhesive cause	Hypocupremia	88	23.3%
	Hyperzincemia	162	43%
	Both	127	33.7%
What can be the excessive use of denture adhesive cause?	Weakness	48	12.7%
	Numbness of the lower limb	146	38.7%
	Urinary incontinence	44	11.7%
	All of the above	139	36.9%
What advice should be given to patients to watch out before using adhesive?	Hypersensitivity	16.8%	64
	Contact allergy	44.2%	168
	Numbness, tingling sensation, weakening of extremities	38.9%	148
What instructions should be instructed to your patients after removal of denture?	Cleaning of denture after every use	32	8.4%
	Gargle your mouth after removal of denture	30	7.9%
	Ask patient to visit dentist once in every 6 months	18	4.7%
	All of the above	300	78.9%

Discussion:

In the United States, the first patent for denture adhesive was issued in 1913. The American Dental Association first reported on denture adhesives in 1935. Initially, denture adhesive was made from a combination of vegetable gums. later Calcium salts were introduced in the 1970s, zinc in the 1980s, and combined polymethyl vinyl ether-maleic anhydride zinc is used in current formulations [13]. According to the manufacturer of these zinc-containing denture creams, their products contain low amounts of zinc and that average users will absorb roughly 2 mg of zinc per day, which is less than the recommended daily allowance of 8-11 mg. Spinazzi et al. [14] and Nations et al. [15] were the first to report denture adhesives as a possible source of hyperzincemia. Later, Hedera et al. [16] published a survey of 11 patients with the syndrome in which denture adhesive was identified as a source of excessive zinc in 100% of their patients. The continued discovery of cases of hyperzincemia and hypocupremia correlated with these products, despite product warnings and modifications in manufacturer guidelines, is most likely due to overuse of these products due to ill-fitting dentures. The powder form may be more dangerous to patients because it is more easily aspirated and may jeopardise the health of denture wearers.[17] Dental adhesives may contain varying concentrations of methacrylate monomers, such as TEGDMA, UDMA, HEMA, PENTA, and bis-GMA, which may affect their toxicity. Synergistic interactions between them may also result in an amplified toxic effect when compared to the individual monomers [18].

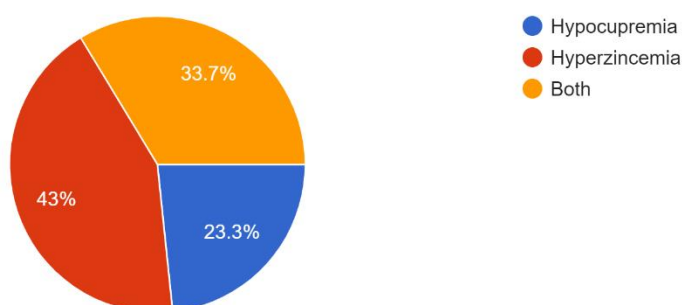
3. Do you use denture adhesives in your clinical practice?

380 responses



13. Excessive uses of denture adhesive cause

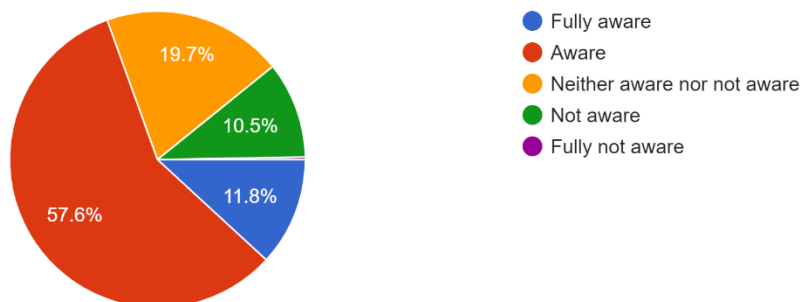
377 responses



Our study reveals that dental practitioners' knowledge of denture adhesive toxicity is limited, and they should be made aware of the toxic effects of zinc and other denture adhesive components. Probable reasons for this were a lack of awareness among prescribing dentists, a lack of education about its side effects, and counselling to patients [19,11] regarding denture usage, denture relining and rebasing as residual ridge resorption occurs over time, as well as the dangers of dentists overusing denture adhesives, ill-fitting dentures, and costs associated with getting denture fixed or changed, which corresponds to the study done by Khimani et.al [20].

10. Are you aware that the composition of denture adhesive causes any side effects?

380 responses

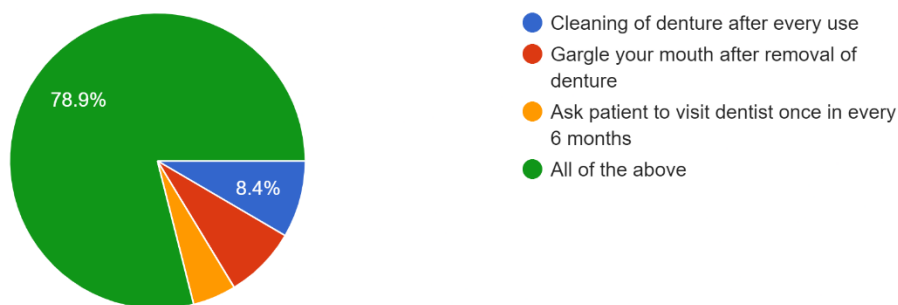


Most patients opting for complete dentures in India are from poor socioeconomic groups, thus it is the treating dentist's role to advise them about the effects of long-term use of denture adhesives and encourage them to choose zinc-free adhesives if necessary. Furthermore, patients who use denture adhesives obtained through over-the-counter prescriptions should be educated about the potential dangers. Many companies are now producing denture adhesives that do not contain zinc and are marketed as "zinc-free adhesives." [21]

The study's limitations include the fact that it was conducted on a small population of dentists in Tamil Nadu. The same study could be conducted on dentists from different parts of India to reveal the lack of awareness about this topic and its toxicity. With the trending era of patient-centered outcomes, it is imperative that doctors value patients' opinions and perspectives and that they are informed and educated about the benefits and drawbacks of using denture adhesives. As a result, the study's future implications could include the patient's perspective or awareness of the use of denture adhesive.

16. What instructions should be instructed to your patients after removal of denture?

380 responses



Conclusion:

Patients who report difficulties from long-term use of denture adhesives are frequently misdiagnosed or go unnoticed. The above study assessed practitioners' awareness of denture adhesive toxicity caused by long-term overuse of denture adhesives, and they were enlightened about the symptoms, studies, and complications caused by long-term use of denture adhesives and its toxicity. Dentists can help prevent it by educating patients directly or through social media such as radio, television, or awareness camps about the use of denture adhesives, as well as detecting early signs of copper deficiency in patients who may be overusing zinc-containing denture adhesive. Still, dentists have a long way to go before their knowledge of the harmful effects becomes widespread.

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