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Uses of Denture Adhesive - A Survey on Dental Practitioners

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Abstract **Original Research Article**

***Background*:** Denture adhesives are widely used as adjuncts to improve the retention, stability, and comfort of complete dentures. Despite their potential benefits in enhancing masticatory efficiency and psychological confidence, their use remains inconsistent among dental practitioners and largely unfamiliar to many complete denture wearers. Limited awareness, misconceptions about safety, and a lack of standardized guidelines contribute to underutilization. The study objective was to investigate the complete denture wearers and dentists toward denture adhesive and to initiate awareness for the same. ***Methods*:** This descriptive cross-sectional survey was conducted to evaluate the awareness, usage, and perception of denture adhesives among dental practitioners and complete denture wearers at some of dental clinics in Uttara, Dhaka from 01 01 2025 to 31 01 2025. A total of 200 survey forms were distributed to dental practitioners across various clinics, hospitals, and academic institutions. ***Results*:** The results of this survey indicated that 60% of dentists for their practice used denture adhesives. Complete denture wearers lack awareness regarding use of denture adhesives as 80% of them had never tried denture adhesives. Maximum dentists are not familiar with good effects. Overall, 50% of patients were satisfied with adhesive use, 40% experienced temporary improvement, while 12% remained dissatisfied**.** ***Conclusion*:** Our goal should be emphasized that denture adhesives are beneficial adjunct to improve ft, comfort and function of dentures and psychological security of patients when indicated. When dentists are advised to use for good result and overcome the problems then patients are use.

Keywords: Complete Dentures, Denture Adhesives, Denture Retention, Dental Practitioner Survey, Prosthodontics.

INTRODUCTION

The edentulous state poses significant functional and psychological challenges for patients, most notably affecting mastication, speech, and esthetics [1]. One of the most common prosthetic interventions for the rehabilitation of edentulous patients is the complete denture prosthesis. These intraoral devices aim to restore oral function and improve the quality of life for individuals who have lost all their natural teeth [2]. Among their benefits, complete dentures significantly enhance masticatory efficiency, allowing patients to regain their ability to chew and digest food properly, thereby improving overall nutrition and systemic health [3].

Despite advancements in materials and techniques in prosthodontics, one of the persistent challenges faced by clinicians and patients alike is achieving and maintaining adequate denture retention and stability [4]. Poor retention often leads to discomfort, reduced function, compromised esthetics, and psychological distress [5]. This issue is particularly pronounced in the mandibular arch due to its smaller denture-bearing area, greater mobility, and anatomical variations. In this context, denture adhesives have emerged as a valuable adjunct in complete denture therapy [6].

Denture adhesives are non-toxic, water-soluble materials that are applied to the tissue surface of dentures to enhance their retention, stability, and comfort [7]. These materials work primarily by absorbing saliva, swelling, and forming a viscous layer that increases adhesion between the denture base and the mucosal tissues [8]. This not only helps reduce denture movement during function but also contributes to patient confidence and satisfaction by providing a sense of security while speaking or eating [9]. In addition, denture adhesives may reduce food particle penetration beneath the denture base, improve phonetics, and minimize tissue irritation

in some cases [10].

Despite the potential benefits, the use of denture adhesives is not universally accepted or understood. Many patients remain unaware of the existence or proper use of these products, and among those who are aware, misconceptions and improper usage are common [11]. Equally, the attitude of dental professionals toward denture adhesives varies widely. While some dentists routinely recommend them as part of complete denture therapy, others are hesitant due to concerns over masking poor denture fit, long-term tissue health implications, or lack of familiarity with different types and compositions of adhesives [12].

Given these gaps, it becomes essential to assess both dental practitioners' and patients' perspectives toward the use of denture adhesives. This survey-based study aims to investigate the knowledge, attitudes, and practices of dental practitioners regarding denture adhesives and to evaluate the level of awareness, usage patterns, and satisfaction among complete denture wearers. The study also explores the rationale behind prescribing or avoiding denture adhesives and identifies potential barriers to their effective use. Through this dual-perspective approach, the study intends to highlight the current trends, misconceptions, and educational needs related to denture adhesive application in clinical prosthodontics.

METHODOLOGY & MATERIALS

This descriptive cross-sectional survey was conducted to evaluate the awareness, usage, and perception of denture adhesives among dental practitioners and complete denture wearers at some of dental clinics in Uttara, Dhaka from 01 01 2025 to 31 01 2025. The study involved the use of a structured and pre-tested multiple-choice questionnaire designed to gather data regarding the knowledge, attitude, and practices related to denture adhesive application.

The questionnaire was developed following a thorough literature review and expert consultation in the field of prosthodontics. It comprised 12 close-ended questions aimed at assessing awareness levels, usage frequency, types of denture adhesives used, and beliefs about their benefits and drawbacks. Additionally, a provision for open-ended responses was included in selected items to allow respondents to express specific opinions or elaborate on their choices. The questionnaire was subjected to face and content validation by senior prosthodontists, and necessary modifications were made based on the feedback received.

A total of 200 survey forms were distributed to dental practitioners across various clinics, hospitals, and academic institutions. The questionnaires were disseminated both manually and electronically, ensuring anonymity and voluntary participation. Out of the total, 120 dentists completed and returned the questionnaire, resulting in a response rate of 60%.

In addition to dental professionals, the study also included 120 edentulous patients who were wearing complete dentures. Among them, 80 were males and 40 were females. These patients were selected from the outpatient department of prosthodontics at a dental teaching hospital. Inclusion criteria included patients aged over 40 years, edentulous for more than one year, and currently using complete dentures. Informed consent was obtained from all participating patients after explaining the purpose and nature of the study. Ethical approval was secured from the institutional review board prior to the commencement of the study.

For patient participants, a separate, interviewer-administered questionnaire was used to minimize literacy bias. This questionnaire captured demographic data, denture history, previous experience with denture adhesives, perceptions about their efficacy, and any difficulties faced during usage.

All the responses collected from both groups were systematically coded and entered into a database for analysis. The data were analyzed using Statistical Package for the Social Sciences (SPSS) software, version 25.0. Descriptive statistics such as frequencies and percentages were used to summarize the categorical variables. The results were presented in tabular and graphical formats to enhance clarity and interpretation. Cross-tabulations were also performed where necessary to identify patterns and trends among different subgroups.

RESULTS

Table 1: Dentists' Prescription Patterns and Forms of Denture Adhesive Used

Parameter	Response	Number	Percentage
Prescription Frequency	Regularly prescribed	72	60%
	Sometimes prescribed	42	35%
	Never prescribed	6	5%
Preferred Form	Powder	84	70%
	Cream	54	45%
	Pads/Strips	8	7%
	Gel	~0.22	~0.22%

Table 1 presents the prescription patterns and preferred forms of denture adhesives among participating dental practitioners. The data reveals that a majority of dentists (60%) regularly prescribe denture adhesives in their clinical practice, while 35% do so occasionally and 5% never recommend them. Regarding the preferred forms, powder-based adhesives were most commonly used (70%), followed by cream (45%), with a smaller proportion opting for pads or strips (7%). A negligible percentage (~0.22%) mentioned using adhesive in gel form.

Table 2: Knowledge of Denture Adhesive Composition and Mechanism

Parameter	Response	Number	Percentage
Common Constituent	Carboxymethyl cellulose	96	80%
	Silicone	10	8.50%
	Polysulfide	7	6%
	Polyvinyl siloxane	6	5%
Mechanism of Action	Increases saliva viscosity	72	60%
	Decreases saliva viscosity	10	12%
	Denied all listed mechanisms	12	14.40%

Table 2 illustrates the awareness of dental practitioners regarding the composition and working mechanism of denture adhesives. A significant majority (80%) correctly identified carboxymethyl cellulose as the most common constituent, while smaller proportions selected silicone (8.5%), polysulfide (6%), or polyvinyl siloxane (5%). Regarding the mechanism of action, 60% believed that denture adhesives work by increasing the viscosity of saliva, whereas 12% believed the opposite. Notably, 14.4% did not agree with any of the listed mechanisms, indicating potential knowledge gaps in this area.

Table 3: Dentists' Use in Clinical Practice and Indications

Parameter	Response	Number	Percentage
Use in Practice	Regular use	30	25%
	Sometimes used	72	60%
	Never used	5	6%
Clinical Indications	Jaw relation trial base stabilization	301	65%
	Stabilization during try-in	72	60%
	During denture delivery	60	50%

Table 3 highlights the frequency of denture adhesive use by dental practitioners in clinical settings, along with its primary indications. While only 25% reported using adhesives regularly, 60% used them occasionally, and 6% never incorporated them into practice. Among clinical applications, adhesives were most commonly used during jaw relation procedures (65%), followed by stabilization during try-in (60%) and during denture delivery (50%).

Table 4: Perceived Limitations and Efficacy of Denture Adhesives

Parameter	Response	Number	Percentage
Does not reduce food debris	Yes	24	20%
Does not improve chewing efficiency	Yes	30	25%
Does not improve denture coloration	Yes	90	75%
Does not reduce mucosal irritation	Yes	30	25%
Improves mastication and phonation	Yes	60	50%
May improve mastication and phonation	Yes	30	25%
Don't know	Yes	12	10%

Table 4 outlines dentists' perceptions of the limitations and functional benefits of denture adhesives. While 75% believed adhesives do not improve denture coloration, 25% felt they do not enhance chewing efficiency or reduce mucosal irritation. Notably, 50% acknowledged improvements in mastication and phonation, with an additional 25% considering possible benefits. A small group (10%) expressed uncertainty, suggesting varying levels of clinical confidence in the efficacy of denture adhesives.

Table 5: Knowledge about Zinc Toxicity and Benefits in Xerostomia

Parameter	Response	Number	Percentage
Awareness of zinc toxicity	Aware	30	25%
	Not aware	10	12%
	Not sure	60	50%
Benefits for xerostomic patients	Facilitates cleansibility	60	50%
	Increases frictional stability	72	60%
	Provides cushioning/lubrication	60	50%
	Eases placement/removal	30	25%

Table 5 reflects dental practitioners' knowledge about zinc toxicity from denture adhesives and their understanding of the potential benefits for xerostomic patients. Only 25% were aware of zinc-related neurological risks, while half were uncertain. Regarding benefits in xerostomia, most respondents agreed that adhesives enhance frictional stability (60%), improve cleansibility (50%), and provide cushioning (50%), with 25% noting ease in placement and removal.

Table 6: Perceived Adverse Effects of Improper Use

Side Effect	Number	Percentage
Oral flora imbalance	60	50%
Alveolar bone resorption	60	50%
Candidiasis	60	50%
Denture stomatitis	72	60%
Leukoplakia	12	10%
Oral cancer	10	12%

Table 6 presents dental practitioners' perceptions of potential adverse effects resulting from the improper use of denture adhesives. The most frequently cited complications include denture stomatitis (60%), oral flora imbalance (50%), alveolar bone resorption (50%), and candidiasis (50%). Less frequently, leukoplakia (10%) and oral cancer (12%) were also associated, indicating concerns over long-term misuse and the need for patient education and clinical supervision.

Table 7: Motivations for Denture Adhesive Use (Dentists' Perspective)

Reason	Number	Percentage
Improves denture fit	60	50%
Provides psychological comfort	96	80%
Masks underlying denture issues	30	25%
Helps avoid dental visits	30	25%

Table 7 outlines the key motivations reported by dentists for recommending or supporting the use of denture adhesives. The most commonly cited benefit was providing psychological comfort to patients (80%), followed by improved denture fit (50%). A smaller proportion believed adhesives help mask denture issues (25%) or reduce the frequency of dental visits (25%).

Table 8: Source and Form of Adhesive Used by Patients

Source of Indication	Number	Percentage
Dentist	90	75%
Self	30	25%
Friend	10	12%
Type Used	Powder	75%
	Cream	12%
	Pads/Strips	5%

Table 8 presents data on how patients obtain denture adhesives and the preferred forms they use. The majority (75%) reported that their use of adhesives was based on dentist recommendations, while 25% used them on their own, and 12% were influenced by friends. Powder form adhesives were the most commonly used (75%), followed by cream (12%) and pads or strips (5%).

Table 9: Duration and Perceived Improvement after Use (Patients)

Duration of Use	Number	Percentage
Up to 1 month	30	25%
1 to 6 months	28	30.40%
6 months to 1 year	40	43.40%
Perception of Improvement	Improved a lot	26.1
	Improved a little	52.1
	No improvement	21.7

Table 9 summarizes the duration of denture adhesive use among patients and their perceived level of improvement. Most patients used adhesives for extended periods, with 43.4% using them between six months and one year. Regarding outcomes, 26.1% reported significant improvement, 52.1% experienced slight improvement, and 21.7% noted no benefit, indicating varying degrees of satisfaction with adhesive efficacy over time.

Table 10: Complaints, Cleaning Method, and Satisfaction (Patients)

Parameter	Response	Number	Percentage
Complaints	Taste	30	25%
	Consistency	60	50%
	Removal difficulty	12	10%
Cleaning Method	Running water	60	50%
	Scrubbed with brush	30	25%
	Cotton gauze + hot water	48	40%
Satisfaction Level	Satisfied	60	50%
	Improved for some time	48	40%
	Not satisfied	10	12%

Table 10 outlines patients' common complaints regarding denture adhesives, their cleaning methods, and satisfaction levels. Consistency issues were the most frequent complaint (50%), followed by taste (25%) and removal difficulties (10%). Half of the patients cleaned their dentures under running water, with others using brushing or cotton gauze with hot water. Overall, 50% of patients were satisfied with adhesive use, 40% experienced temporary improvement, while 12% remained dissatisfied, reflecting mixed experiences in daily use.

DISCUSSION

The denture patients have some oral changes affecting denture function and will turn to some type of denture adhesive to achieve the desired function and comfort. According to Zarb and Boucher, there are several factors responsible for retention of complete dentures which include adhesion, cohesion, interfacial surface tension, capillary action, atmospheric tension and facial musculature. These factors, along with proper fabrication of the complete denture, contribute to retain the prosthesis. Denture adhesives act as an adjuvant to increase denture retention and stability, and various research studies suggest that its use significantly decreased displacement of mandibular and maxillary dentures during chewing, biting and speaking [4-7]. This survey was an effort to clarify the various topics on denture adhesive. Such information could be useful for both the dental professionals and dental patients by presenting opinions and beliefs on the topic of denture adhesives.

In our survey, 30 (25%) of all dentists used denture adhesives in clinical steps, 72 (60%) dentists prescribed to their patients when indicated. Thus, it is concluded that majority dentists prescribe denture adhesives to their patients instead of using them during clinical steps. This is in contrast to a recent survey done in Turkey where 60 (50%) of all dentists used denture adhesives in clinical steps, 48 (40%) dentists prescribed to their patients when indicated; the number of dentists who prescribed denture adhesives was relatively less than the ones who used in clinical steps.

In this survey, denture adhesive is referred to a commercially available nontoxic, soluble material (powder, cream or liquid) that is applied to the tissue surface of the denture. According to old literatures and a recent survey; powder form in particular are readily available and the most effective over the counter materials and also they are proven to be used commonly by denture wearers. Fixon and others are the most common denture adhesive in powder form. This survey also yields the same conclusion where majority of the dentists 84 (70%) use denture adhesive in powder form.

The composition of most modern denture adhesives includes constituents that promote bioadhesion via carboxyl groups once the adhesive is hydrated [12-16]. Maximum utilization of denture adhesive by the dentists 78 (65%) in their clinical practice was for stabilizing trial bases during recording jaw relations. This was consistent with the consensus were reached by the prosthodontists panel (88%) in the

study by Slaughter *et al*., the reason being stable record bases is a prerequisite for recording accurate jaw relations [9]. After wearing the denture without adhesives, there was a marked deterioration in the articulation. This is in accordance with Banknson and Byrne who reported that loose dentures will not allow the tongue to function normally and this in turn will affect speech [17].

Nowadays, this philosophy was changed. The use of denture adhesives is highly recommended with patients seeking for extra retention demands that cannot be achieved by the routine protocol of complete denture fabrication [13]. Denture retention and stability were significantly improved with the use of denture adhesives due to the bond created between the denture base and the underlying supporting tissues [14]. The result of this study showed the positive influence of denture adhesive on masticatory function of denture wearers. According to Koronis *et al*., denture adhesive application increases the mastication ability in 66 to 70% of denture wearers [3]. According to our results also, 220 (48.78%) dentists agree with that denture adhesive significantly improvises mastication and phonation. Of late, serious reports on the chronic and excessive use of Zn containing denture adhesive causing potential neurotoxicity have caught the attention of dental fraternity [17-23]. Unfortunately, 36.04% of the dentists were unknowledgeable about the adverse effect of Zn in denture adhesive.

Patients suffering from xerostomia are benefited by the use of well-hydrated denture adhesive as it provides a cushioning or lubricating effect, hence reducing functional irritation to the supporting soft tissues and in turn preventing further tissue dehydration and from denture stomatitis and ulcerations [19-21]. In this study, 72 (60%) dentists agreed with the above statement. Slaughter *et al*., stated that denture adhesives could contribute to the development of denture stomatitis, candidiasis, alveolar bone resorption and imbalance in oral flora, but not leukoplakia or oral cancer [9]. Stafford *et al*., indicated that denture adhesive could influence oral flora by causing an imbalance in the flora [10]. Most of general dental practitioners (47%) were ignorant that prolonged use of denture adhesive on ill-fitting dentures would result in residual ridge resorption [10]. The prolonged use of ill-fitting dentures not only causes trauma to soft tissues, but also accelerates alveolar ridge resorption [24, 25].

In this study, dentists consensus overcome 77.83% on this statement that mentioned denture adhesives are useful for providing a psychological relief to the denture patients and 19.29% stated adhesives also helps in masking underlying denture problems. Our results showed that Knowledge and Attitude toward Denture Adhesives: A Survey on Dentists and Complete Denture Wearers International Journal of Prosthodontics and Restorative Dentistry, it is agreed that denture adhesive be able to enhance the fitness of a denture and provide psychological relief to the patients. In this study, a significant number of patients (76) had never used denture adhesives.

This indicates that most of the patients are not well informed regarding this useful treatment modality. In a study by Coates, almost 30% of patients had tried denture adhesives but only 7% were currently using it [11]. In another study conducted in a previous report, Ozcan *et al*., surveyed 115 patients attending in Marmara University, Istanbul, Turkey, and observed that 92% had never tried denture adhesives [12]. It has been shown that a substantial proportion of denture wearers had tried or currently used denture adhesives [26-28]. Douglass *et al*., stated that 22% of complete denture wearers in USA regularly use adhesives [15].

In this study, most participants that regularly used adhesives were satisfied with its performance, in accordance with previous reports [15-24]. The most unpleasant factors concerning adhesives usage were taste and consistency, but difficulty of removal from oral tissues and dentures was also mentioned, in accordance with previous studies [24].

Overall, the present study achieves its purpose by creating minor inroads into an otherwise unknown domain of use, misuse, conception, misconceptions, practice and malpractice of denture adhesives among the dentists in India. The results from the present study conclude that the knowledge about these dental materials is limited.

Limitations of the Study

The study was limited to a single geographic region, which may not reflect broader population trends. Self-reported data from questionnaires may introduce response bias. The cross-sectional design limits the ability to assess changes in awareness or behavior over time.

CONCLUSION

The general approach by the prosthodontists was that denture adhesives could be prescribed only when it was indicated. According to this survey, it can be determined that a positive change can be observed among the dentists and patients regarding the use of denture adhesives which is found to be in contradiction to various historical literatures. However, regardless of the fact that dentists nowadays use denture adhesives, it was observed that very few among them had suffcient knowledge regarding it.

In conclusion, based on the limitations of the subjective study for patients, it could be shown that the majority of the participants who had never tried denture adhesives showed refusal for the use of denture adhesives and the participants who had used denture adhesives on a regular basis, did have the knowledge of its effcacy. The knowledge of the patients will always

depend on the knowledge of the dentists and how well the dentists educate their patients.

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