

Awareness of Denture Wearers about Denture Adhesives and their use- a Cross-Sectional Survey

HAMMAD HASSAN¹, MUHAMMAD AFZAL², RABIA ASAD³, YOUSAF JAMIL⁴, SHANZEY BATOOL⁵, OMAIMA JAVED⁶, MUHAMMAD HASSAN⁷

¹Assistant Professor, Department of Science of Dental Materials, University College of Medicine and Dentistry, University of Lahore.

²Associate Professor, Prosthodontic Department, Institute of Dentistry, CMH Lahore Medical College, NUMS.

³Associate Professor, Community, and Preventive Dentistry Department, Akhter Saeed Medical and Dental College.

⁴Assistant Professor, Oral Biology Department, Rawal Institute of Health Sciences, Islamabad

⁵Demonstrator, Oral Biology Department, Institute of Dentistry, CMH Lahore Medical College, NUMS

⁶Demonstrator, Periodontology Department, Institute of Dentistry, CMH Lahore Medical College, NUMS

⁷Associate Professor, Department of Science of Dental Materials, University College of Medicine and Dentistry, University of Lahore.

Correspondence to Dr. Hammad Hassan, Email: hammadhassan@gmail.com, Phone: +923147991624

ABSTRACT

Aim: To access awareness of denture wearers about denture adhesives and their use.

Methodology: The study was conducted in the prosthodontic departments of 3 private and 2 public dental institutes in Punjab participated in this study from April to December 2022 with the approval of the IRB using a questionnaire designed by the authors and administered through interviews. The questionnaire consisted of two parts that dealt with the demographics and awareness of adhesives, respectively. The data was analyzed using SPSS version 24.

Results: There was no statistically significant difference between the patients of private and public dental hospitals regarding the condition of the dentures and awareness of the use of denture adhesives. A significant proportion of the respondents (34.3%) had unhygienic dentures, especially from public dental hospitals. The majority of the respondents (63%) never used denture adhesives. The most common type of adhesive used by the respondents was cream/gel (26.4%), followed by adhesive strips (10.9%). The major problem associated with the adhesives was difficulty in the removal of the adhesive (86.1%), followed by bad taste (19.9%) and halitosis (14.9%).

Practical implication: Patients should be educated about the frequency, the method of application of adhesive as well as their side effects and precautions.

Conclusion: Most respondents were unaware and never used denture adhesives. Patients favored adhesives that were in the cream or gel form. The most frequently mentioned issues were halitosis, taste changes, and removal difficulty. Patients should be informed about the frequency, technique, adverse effects, and precautions associated with adhesive application.

Keywords: Awareness, Complete denture, Denture adhesives, Denture hygiene, Halitosis,

INTRODUCTION

Choosing a proper adhesive for dentures is crucial for providing a good fit and preventing the sliding of dentures. When selecting a denture adhesive, three important factors should be taken into account: hold time, usability, and comfort. Hold duration, ease of usage, and comfort all pertain to how long the adhesive will keep your dentures in place, while ease of application assesses how painful or uncomfortable it is to the oral tissues. Every denture adhesive functions differently for different people^{1,2}.

Denture adhesives are indicated in patients with unstable and poorly retentive dentures, neuromuscular disabilities, patients with salivary disorders, and patients who are waiting for rebasing or relining of their prosthesis. However, patients with critical retention and stability issues or those having allergies to the contents of adhesive are not candidates for denture adhesives and must opt for newer dentures or alternative treatments like rebasing or relining, etc. Moreover, long-term use of denture adhesives has been discouraged in the literature³.

Denture adhesives are available in a variety of forms, like gels, strips, powders, and pastes. Paste adhesives are simple to apply but may not have as strong of a grip as gel adhesives, which tend to have a longer hold period but can be challenging to remove. Moreover, factors like odor and taste play an important role when selecting an appropriate adhesive^{4,5}.

Previous data have reported that the majority of prosthodontists are hesitant when it comes to the provision of denture adhesives as they consider it their clinical failure and prefer retreatment or newer prosthesis. Limited data are available about patients' understanding of denture adhesives, but numerous research has been conducted to investigate dentists' knowledge of these products^{6,7,8}.

The aim of this study was to determine the awareness of denture wearers about denture adhesives and their use.

METHODOLOGY

The prosthodontic departments of three private and two public dental institutes in Punjab participated in this study from April 2022 to December 2022 with the approval of the Institutional Review Board (IRB) of University College of Medicine and Dentistry (UCD/ERCA/21/11gr), using the purposive sample method.

The authors devised a structured interviewer-administered questionnaire with 12 close-ended questions, which were later validated by two research professionals. A linguist translated the questionnaire into Urdu and then back into English, and later it was pilot tested and went through multiple changes before it was finalized. The questionnaire consisted of two parts; the first part dealt with the demographics and the duration of the use of prostheses. The second part had questions regarding awareness of denture adhesives and their use.

A total of 200 patients volunteered to take part in the study. The study included mentally stable patients who reported to the prosthodontic department, had complete denture prostheses, were regular denture wearers, and completed the consent form. Patients with disabilities, with mental illnesses and those who refused to consent were excluded. The questionnaire was administered in the outpatient department of the dental SPSS version 24 was used to enter and statistically evaluate the responses. The frequencies and percentages were computed using descriptive statistics. The categorical variables were compared using the chi-square test. A p-value of 0.05 or less was considered significant.

RESULTS

In the present study, a total of 200 participants responded through the interview-administered questionnaire. The response rate was 97%. The demographical data has been presented in Table 1.

Received on 06-02-2023

Accepted on 16-06-2023

Table 1: Demographical data

Demographics		n	%
Gender	Male	108	53.7
	Female	93	46.3
Location	Private Hospital	96	47.8
	Public Hospital	105	52.2
Duration	Less than 3 years	69	34.3
	3 to 5 years	73	36.3
	More than 5 years	59	29.4

There was no statistically significant difference between the patients of private and public dental hospitals when it came to the condition of the dentures. A significant proportion of the respondents (34.3%) had unhygienic dentures, especially from public dental hospitals, who had a higher proportion (16.1%) of dentures falling in the category of "very unhygienic / stained denture." (Figure 1).

Figure 1: The condition of dentures and its comparison between private and public dental institutes

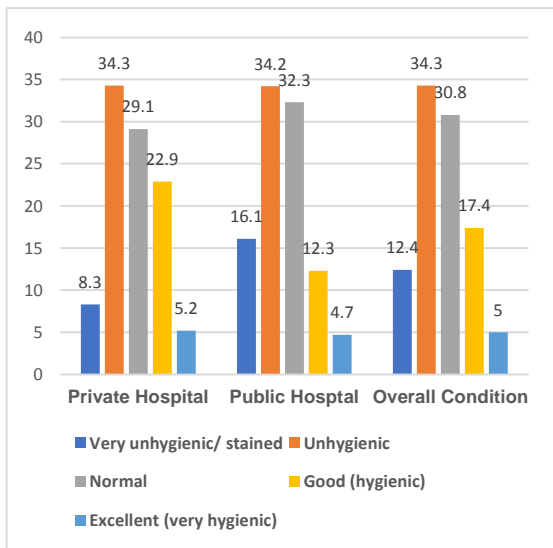
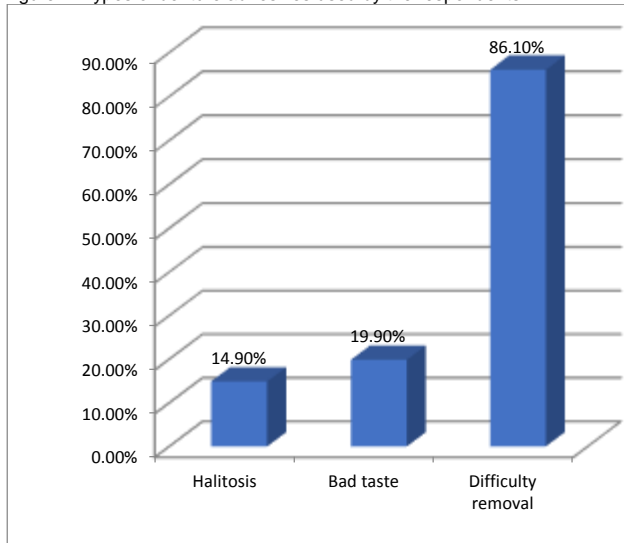


Figure 2: Types of denture adhesives used by the respondents



There was no statistically significant difference between the respondents of private and public dental institutes regarding the frequency of the use of denture adhesives and knowledge of its

duration of application, as exhibited in Table 2. The majority of the respondents (63%) never used denture adhesives. Similarly, amongst those who were aware, the majority of them did not know about the duration of the application of denture adhesives (Table 2).

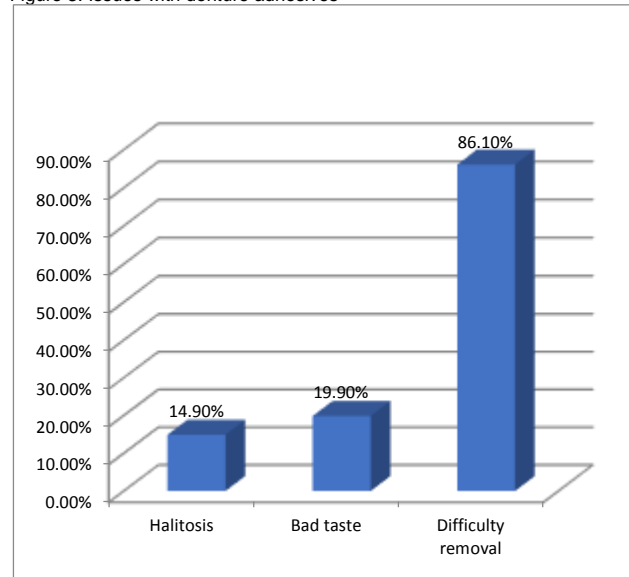
The most common type of adhesive used by the respondents was cream/gel type denture adhesive, followed by adhesive strips. None of the participants in the present study used powdered or zinc-free adhesives (Figure 2).

When asked about the problems and the side effects of the denture adhesives, a significant majority of the respondents reported difficulty in the removal of the adhesive (86.1%), followed by bad taste (19.9%) and halitosis (14.9%) (Figure 3).

Table 2: Frequency of use of denture adhesives and awareness about its duration of application between patients of private and public dental institutes

Variables	%	Private	Public	X ²	p
Use of Adhesive					
Always	3.0	5.2	1	4.2	0.239
Sometimes	14.9	12.5	17.1		
Rarely	18.9	20.8	17.1		
Never	63.2	61.4	64.7		
Duration of Use					
	17.9	20	16	2.7	0.434
2-3 days	20.4	19	22		
More than 3 days	4.5	6	3		
Unaware	57.2	51	64		

Figure 3: Issues with denture adhesives



DISCUSSION

Patients with poor retention of dentures, neuromuscular disorders, severely resorbed ridges, musculoskeletal deformities, and trauma can benefit from denture adhesives. They are mainly composed of the main adhesive agent containing natural or synthetic polymers, antimicrobial agents, and plasticizing and flavoring agents. These adhesives interact with moisture in saliva and swell, resulting in the lateral spread, which creates a vacuum seal by replacing air and saliva, improving retention^{5,9}.

Previous studies have reported a strong correlation between dentures-adhesives and biofilm formation if dentures are not effectively cleaned. Those using denture adhesives have higher odds of acquiring infections as it negatively affects denture hygiene.¹⁰ In the present study, the majority of accumulation and the presence of biofilm as well as staining. The use of adhesives on such dentures may favor biofilm formation and act as a source

of infection for the patient. Therefore, regular denture hygiene must be practiced before using adhesive and after the use of adhesive to prevent biofilm formation⁷.

Plenty of data is available about the awareness and knowledge of adhesives amongst dentists and prosthodontists. However, no data exists in the literature that can report awareness or knowledge about denture adhesives among denture wearers^{3,6,7,9}. In the present study, the majority of the patients were unaware of the existence of such a product, and around six out of every ten patients never used denture adhesives. Only 3% were using adhesives regularly, while around 15% were occasionally using them. This can be attributed to the decreased provision of adhesives by dentists and prosthodontists, as reported in the literature. Prosthodontists typically are reluctant to suggest denture adhesive, preferring instead to have a properly fitted prosthesis. The prescription of adhesives is viewed by many dentists, particularly prosthodontists, as evidence of their subpar clinical abilities. Many dental professionals believe they conceal manufacturing flaws and negatively affect follow-up. Consequently, they favor fabricating new dentures or relining existing ones. The doctor should be able to openly communicate with his patients about the benefits and drawbacks, as well as the appropriate use and improper use of denture adhesives^{3,6,11}.

In the present study, around 8 out of every ten patients were ill-informed or not properly aware of the duration of the application of denture adhesives. One application should last one day, as reported in previous studies; however, a long-term application may negatively affect denture hygiene and promote biofilm formation^{3,6,12}.

Previous researches indicate that dentists prescribe cream/gel adhesives more frequently. Additionally, research suggests that cream adhesives are more effective than strip adhesives. The findings of the current investigation agreed with the earlier data.^{4,7,11} The majority were using cream/gel adhesives in this study.

The common problems associated with denture adhesives reported in the literature were alteration in the microbial population, hyperglycemia, allergy, mechanical irritation, stomatitis, halitosis, gag, difficulty removal, and altered taste sensation or bad taste. The major problems reported in the present study were difficulty removal, bad taste, and halitosis. Literature suggests the use of a damp exfoliating glove, a soft brush with toothpaste followed by warm water may help remove residues of adhesive from the gums and dentures^{5,12,13}.

The United States Food and Drug Administration (FDA) recommends not to use no more adhesive than is advised and recognizes that some denture adhesives include zinc and that, while they are safe to use when used as advised in moderation, they may cause harm if used excessively. Start using a tiny amount of adhesive and always consult their dentist about poor retention¹⁴⁻¹⁷. Medical resources, diagnosis, and treatment must improve in developing countries. There are limited resources available on dental education in Pakistan: lack of access to medical and health resources to the patients about disease; limited knowledge and understanding, and awareness about disease. The trainings should be conducted to improve the dental health education and how to access the medical resources for patients in Pakistan¹⁸⁻²⁴.

CONCLUSION

Denture adhesives are helpful adjuncts rather than definitive treatments. They are helpful if used in moderation according to the recommended criteria. The majority of the respondents were unaware and had never used denture adhesives. The majority had unhygienic dentures. Amongst those who used it, the majority had no knowledge of its duration of application and use. Cream / gel-type adhesives were preferred by the patients. The most common problem reported was difficulty removal, altered taste, and halitosis. Patients should be educated about the frequency, the

method of application of adhesive as well as their side effects and precautions.

Authorship and contribution declaration: Each author of this article fulfilled following Criteria of Authorship:

1. Conception and design of or acquisition of data or analysis and interpretation of data.
2. Drafting the manuscript or revising it critically for important intellectual content.
3. Final approval of the version for publication.

All authors agree to be responsible for all aspects of their research work.

Ethics Approval: Ethical approval for the study was granted by the Institutional Ethical Review Committee

Source of Funding: The authors did not receive any institutional or corporate funding or financial support for this research.

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Nagaraj E, Kondody RT, Kalambettu A, Vinnakota DN, Hari J. Changing trends and clinical recommendations of denture adhesive in complete denture: A review. *Journal of Dental Research and Review*. 2021;8(3):228.
2. Shu X, Fan Y, Lo EC, Leung KC. A systematic review and meta-analysis to evaluate the efficacy of denture adhesives. *Journal of Dentistry*. 2021;108:103638.
3. Deshmukh M, Rajaraman V, Duraisamy R, Maiti S. Knowledge, awareness, and attitude of dentists toward use of denture adhesives in Tamil Nadu: A questionnaire survey. *Journal of Advanced Pharmaceutical Technology & Research*. 2022;13(5):243.
4. Kumar MS, Thombare RU. A comparative analysis of the effect of various denture adhesives available in the market on the retentive ability of the maxillary denture: an in vivo study. *The Journal of Indian Prosthodontic Society*. 2011;11(2):82-8.
5. Kumar PR, Shajahan PA, Mathew J, Koruthu A, Aravind P, Ahammed MF. Denture adhesives in prosthodontics: an overview. *Journal of international oral health: JIOH*. 2015;7(Suppl 1):93.
6. Khawaja MSA, Masood A, Ahmed T, Anwar P, Bin Sohail RS, Javed F. Awareness of house surgeons regarding denture adhesives in dental colleges of Islamabad and Rawalpindi. *Pakistan Journal of Medical and Health Sciences*. 2021;15(5):1183-6.
7. Namrata M, Ganapathy D. Awareness about denture hygiene: A survey among patients wearing complete dentures and removable partial dentures. *International Journal of orofacial biology*. 2017;1(2):59.
8. Jagger R, King E. Denture Adhesives--Best Practice. *Dental Update*. 2020 Jan 1;47(1):38-42.
9. Tewary S, Shinde SB, Pawashe KG, Sanyal PK, Joshi S, Belgaumi U. Denture Adhesives--Knowledge and Tradition among Denture Wearers in Western Maharashtra Population--A Survey. *Journal of Evolution of Medical and Dental Sciences*. 2020;9(30):2089-93.
10. Costa MS, Lovato da Silva CH, de Cássia Oliveira V, Watanabe E, Dos Reis A, Lepri CP, de Castro DT. Effects of Different Forms of Denture Adhesives on Biofilm Formation, Adhesive Strength and Hygiene of Complete Dentures. *The International Journal of Prosthodontics*. 2022.
11. de Figueredo OM, Gama LT, Câmara-Souza MB, Marañón-Vásquez GA, Magno MB, Maia LC, Gonçalves TM, Garcia RC. Influence of different presentations of denture adhesives on masticatory function of complete denture wearers: A systematic review and meta-analysis. *The Journal of Prosthetic Dentistry*. 2021.
12. Papadiochou S, Emmanouil I, Papadiochos I. Denture adhesives: a systematic review. *The Journal of prosthetic dentistry*. 2015;113(5):391-7.
13. Tezvergil-Mutluay A, Carvalho RM, Pashley DH. Hyperzincemia from ingestion of denture adhesives. *The Journal of prosthetic dentistry*. 2010;103(6):380-3.
14. Denture adhesives are pastes, powders or adhesive pads that may be placed [Internet]. U.S. Food and Drug Administration. FDA; [cited 2023 Jan 11]. Available from: <https://www.fda.gov/medical-devices/dental-devices/denture-adhesives>
15. Farid G, Warrach NF, Iftikhar S. Digital information security management policy in academic libraries: A systematic review (2010-2022). *Journal of Information Science*. 2023;01655515231160026.
16. Hassan H, Rafique A, Andleeb S, Javaid M, Ahmad H, Khalid S. Post-insertion complaints associated with complete denture prosthesis in a

- tertiary care hospital. Rawal Medical Journal. 2023;48(1):200–200. Available from: <https://www.rmj.org.pk/?mno=81263>.
17. Jabeen M, Shahjahan M, Farid G. Information Dissemination during COVID-19 Pandemic among Postgraduate Allied Health Sciences Students in Pakistan. *Pakistan Journal of Medical & Health Sciences*. 2022;16(11):366-.
 18. Shahjahan M, Jabeen M, Farid G. Information Providing in COVID-19 by Health Professionals in Pakistan. *Pakistan Journal of Medical & Health Sciences*. 2022 Dec 12;16(10):641-.
 19. Hassan H, Khalid S, Rafique A, Zahid F, Khurram M, Khalid R. Hand hygiene awareness, attitude and compliance among house officers in public-sector dental institutes- A questionnaire-based study. *Pakistan Journal of Medical and Health Sciences*. 2022;16(5):961–4.
 20. Farid G, NiaziAk, Muneeb M, Iftikhar S. Attitude towards Utilization of e-Resources of Medical Images among Health Care Professionals. *Pakistan Journal of Medical and Health Science*. 2021 Sep 15 (9);261-263
 21. Hassan H, Ali SM, Riaz S, Aziz S, Saleem MN, Raja HZ. Prevalence of endodontic mishaps and their management in private and public dental institutes in Punjab, Pakistan. *Rawal Med J [Internet]*. 2023 [cited 2023 Jul 6];48(2):468–468. Available from: <https://www.rmj.org.pk/?mno=79757>
 22. Farid G, Abiodullah M, Ramzan M. A comparative study of information seeking behaviors of medical faculty working in government and private run medical colleges. *International Journal of Information Management Science*. 2013;2(1):17-24.
 23. Baladi ZH, Farid G, Gulzar A, Hussain M, Iftikhar S, Naz M. Examining Authorship Dynamics, Publication Patterns, and Affiliations in the Pakistan Journal of Medical and Health Sciences (PJMHS) from 2009-2019. *Pakistan Journal of Medical & Health Sciences*. 2023 Jun 24;17(05):277-.
 24. Shahbaz T, Farid G, Asghar RS, Rashid A. Hepatitis B And C: Knowledge, Attitude and Behavior Of Health Care Workers At RImc And Affiliated Hospitals (Amth&Hlh). *The Professional Medical Journal*. 2015 Nov 10;22(11):1383-9.

This article may be cited as: Hassan H, Afzal M, Asad R, Jamil Y, Batool S, Javed O, Hassan M: Awareness of Denture Wearers about Denture Adhesives and their use- a Cross-Sectional Survey. *Pak J Med Health Sci*, 2023; 17(8): 51-54.