



Pattern and Frequency of Acrylic Stock Teeth Usage in Prosthodontic Patients of a Teaching Hospital of Punjab

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ABSTRACT

Back ground: Acrylic stock teeth are widely used for replacement of partial or complete loss of teeth in denture patients because of cost effectivity, aesthetics and easy modification. **Objective:** To find out the frequency of acrylic stock teeth usage in complete and partial dentures (RPDs) and determine the association of usage pattern of stock teeth in RPDs within age groups and gender. **Methodology:** The Secondary data collected from patients' laboratory work authorization registers between year 2023 to 2024 from prosthodontic laboratory. The records of patients attending for partial or complete loss of teeth and need replacement via complete and partial dentures were selected. The parameters of the study were patients' age groups, frequency and percentages of stock teeth used with respect to gender and types of dentures. **Results:** A total of 1,306 acrylic dentures; 54.1% sets of complete dentures and 45.9% partial dentures were made. 56.0% males and 52.0% female patients received complete dentures whereas removable partial dentures were fabricated for 44.0% males and 48.0% females. Maximum number of stock teeth used in age group <50 years were in anterior maxilla; 91.4%, whereas in >50 years 87.8% teeth used in posterior maxilla. Maximum male had teeth replacements in posterior mandible 76.9% and females had in anterior maxillary 84.6%. The association of stock teeth with respect to age groups and gender was statistically significant $p < 0.05$. **Conclusion:** In our region, partial and complete edentulism are prevalent, with a high demand for tooth replacements. Notably younger individuals often require replacement of anterior maxillary and mandibular teeth, whereas older individuals tend to need more posterior teeth replacements in both jaws.

INTRODUCTION

The partial or complete loss of tooth demands replacement of lost teeth as well as associated soft tissues. In developing countries, the popular choice of dental prosthesis in case of partial edentulism is removable partial dentures (RPD) and for complete edentulism complete dentures are mostly provided.¹ The denture prosthesis effectively restores patients' esthetics, phonetics, mastication and social wellbeing.² The reason behind their popularity and preferred choice is their low cost, easy fabrication, less maintenance and easy repair.³ Even in developed countries like united states the use of RPD has increased over time due to decline of completely edentulous condition due to better health care.³ Furthermore, the global population is aging and older patients are more prone to tooth loss due to underlying systemic diseases like diabetes mellites. Traumatic injuries, accidents and sports related injuries are few other common causes of

people losing their teeth. All these factors that result in increased tooth loss had led to a growing demand of dentures.^{4,5}

In case of partial loss of teeth and tissues there are other treatment options besides removable partial dentures that include fabricating fix to fix bridge, resin bonded bridges and implant supported restorations.⁶ These treatment options have potential disadvantages of being highly expensive, complex procedures and nonconservative. Partial and complete dentures are made up of polymethylmethacrylate known as acrylic.⁷ The acrylic stock teeth are prefabricated standardized artificial teeth used to replace lost teeth in complete and partial dentures. Acrylic dentures are mostly in demand and delivered to patients with poor socio-economic status as compared to the cobalt chromium dentures because of cost effectiveness, easy availability, less clinical time and relatively short delivery period.⁸ Besides low-cost acrylic

dentures have added advantages of easy relining and adjustments in cases of ridge resorption in patients with prolonged denture wearing, diabetes and conditions like osteoporosis. Furthermore, the acrylic dentures can easily be altered and future loss of teeth can be incorporated using stock teeth.⁹

The prevalence rates of complete and partial dentures in different parts of the world had been documented.^{10,11} In our country, especially in Punjab few studies however have highlighted the prevalence of complete and partial denture usage with respect of age and gender.^{12,13} However, the studies demonstrating the pattern of tooth loss whether anterior, posterior, maxillary tooth loss or mandibular tooth loss are scarce thus highlighting the need for further research.

A clear understanding of the pattern of denture demand and associated distribution of stock teeth is very important as this information will enable to understand oral rehabilitation needs of prosthodontic patients and guidance in restorative treatments like designing of RPDs. In addition, it will help in understanding pattern of tooth loss and will also enable prosthodontists to recognize natural teeth that are vulnerable to early loss thus preventive measures can be taken to reduce the risk of loss of most vulnerable teeth. The objective of the current study was to find out the frequency of acrylic stock teeth usage in complete and partial dentures (RPDs) and determine the association of usage pattern of stock teeth in RPDs within age groups and gender.

METHODOLOGY

It was a cross-sectional study carried out in the department of Prosthodontics of Lahore Medical and Dental College, Lahore in 3 months period. Secondary data was collected from patients' laboratory work authorization registers between year 2023 to 2024. The parameters of the study were patients' age groups, frequency and percentages of stock teeth used with respect to gender, Jaws, type of dentures. Non probability purposive sampling was used for data collection. Inclusion criteria was set to include records of patients attending to prosthodontic clinic for partial or complete loss of teeth and need replacement via removable complete and partial dentures in past one year. Patients of 20 years or above age were included. Exclusion criteria was set and patients records of repaired dentures, copy dentures, those with insufficient details and required information were excluded. The anonymity and confidentiality of patients whose laboratory records were employed for the study were preserved. The ethical clearance was obtained from Ethical Review Board of the Dental College; Ref No. FD/617/25.

Data was entered and analyzed using computer software SPSS window version 26. Described data was presented as frequencies, percentages, means and SD. Chi Square test will be used to find out the association of stock teeth usage pattern within age groups and gender. Significance level was set as $p < 0.05$.

RESULTS

A total of 1,306 acrylic dentures where 706; 54.1% sets of complete dentures and 600;45.9% removable partial

dentures fulfilling the section criteria were selected in the year 2023 till 2024. The frequency of male patients was 670;51.3% and that of female patients was 636;48.7%. Completed dentures were fabricated for 375;56.0% male and 331;52.0% female patients. Removable partial dentures were fabricated for 295; 44.0% male and 305;48.0% female patients.

The age of the patients ranged from 23 years to 82 years with mean age $60.37 \pm SD 13.14$. The frequency of sets of stock teeth strips used during the year was shown in Table 1. A total of 308;23.6% stock teeth strips were used in maxilla and 292;22.4% in mandible. Maximum teeth replaced in age group < 50 years were the maxillary stock teeth 53.9% whereas mandibular stock teeth 63.0% were frequently used in older age group. The stock teeth strips used in anterior maxilla were 148; 91.4%, whereas 18;12.2% in posterior maxilla in age group < 50 years. 88;50.9% and 20(17.1%) stock teeth strips were used in anterior mandible and posterior mandible in age group < 50 years. Maximum stock teeth strips were used in posterior maxilla 130;87.8% in age group > 50 years and least were in anterior maxilla 14(8.6%). Table 2. Maximum male had replacement of posterior maxilla and posterior mandible 95;64.2%, 90;76.9% respectively. In female patients' maximum teeth used were in anterior maxilla 137;84.6% followed by anterior mandible 88;50.9%. The association of number of strips of stock teeth used in RPD fabrication with respect to age groups and gender was statistically significant $p < 0.00$. Table 2.

Table 1

Frequency Distribution of Sets of Stock Teeth Strips Used in RPDs' Fabrication=600

Stock teeth strips	Frequency (%ages)
Anterior Maxilla	162(12.4%)
Posterior maxilla	148(11.3%)
Anterior Mandible	173(13.2%)
Posterior mandible	117(9.0%)

Table 2

Association of Number of Strips of Stock Teeth Used in RPD Fabrication with Age and Gender, N=600

Stock teeth strips	Age groups		Gender	
	<50 years n; %age	>50 years n; %age	Males n; %age	Females n; %age
Anterior maxilla	148(91.4)	14(8.6)	25(15.4)	137(84.6)
Posterior maxilla	18(12.2)	130(87.8)	95(64.2)	53(35.8)
Anterior mandible	88(50.9)	85(49.1)	85(49.1)	88(50.9)
Posterior mandible	20(17.1)	97(82.9)	90(76.9)	27(23.1)
P	0.00		0.00	

Significance level set as; $p < 0.05$

DISCUSSION

The current study was conducted to find out the frequently demanded pattern of acrylic dentures; both complete and partial removable in patients attending to a Dental College of Punjab.

Overall, more male 51.3% than female patients 48.7% attended the dental hospital for provision of dentures. Nono¹⁴ and coworkers similarly, reported more male patients with tooth replacements and reported that tooth

loss due to accidents, tooth decay and tooth cracking was escalated in the patients because of self-medication and delaying in seeking treatment. In contrast Khan¹⁵ and coworkers reported that partial edentulism was frequently seen in females. The current study results showed that a total of 1,306 dentures were fabricated in a year span where the percentage of delivering acrylic complete dentures was more 54.1% as compare to partial dentures 45.9%. When compared the provision of complete and partial dentures in the present study more female patients demanded partial dentures 48.0% and more male patients demanded complete dentures 56.0%. In accordance with results of current study; Pan¹⁶ and coworkers reported more female patients with tooth loss and stated that females especially those who had poor hygiene, infrequent scaling and flossing were more at risk of tooth loss. Likewise old females who have undergone menopause also lost teeth due to bad hygiene despite of any hormonal change.¹⁶

In the current study anterior teeth replacement in both maxilla 84.6% and mandible 50.9% was frequently found. Aesthetics could be the reason behind the replacement of anterior teeth in both arches. Moreover, the study showed more stock teeth replacements in maxillary arch 23.6% as compare to mandibular arch 22.4%. Similarly, Amar¹⁷ and coworkers reported 47.6% patients with maxillary teeth loss and only 2.94% with mandibular tooth loss whereas 49.41% patients had missing teeth in both arches.

The mean age of patients who requested for acrylic dentures was 60.37 years in our study and association of age and gender with respect to tooth loss was significantly seen. In contrast a study reported the fact that prevalence of tooth loss does not increase with increasing age however, the tooth loss prevalence was significantly increased with age among the female population only.¹⁸ Khan¹⁵ and coworkers reported that increasing age increases the risk of tooth loss, similarly, Amar¹⁷ and coworkers reported that the age is a significant factor in losing teeth. Jaleel¹⁹ and coworkers reported higher prevalence of tooth loss 57% among adults aged 35–74 years in Davangere taluk, Karnataka. They also reported a significant association of tooth loss in rural areas as compared to urban where more tooth loss was seen in rural. Tomar²⁰ and coworkers likewise reported significantly higher tooth loss in 35–44-years age group population. The prevalence of tooth loss among sample of young age group as compared to elderly population was found to be lowest. This was in agreement with Begum²¹ and coworkers who showed highest and lowest prevalence of missing teeth among the old population 96.18% and

younger age group respectively 12.78%. In contrast Hessari²² and coworkers in their epidemiological study demonstrated a higher prevalence of tooth loss in young people including 3% completely edentulous subjects in young population of 35 years, whereas Bonakhdarchian²³ and coworkers reported only 9% total edentulism. In contrast, studies conducted in Sri Lanka and China, did not reported complete edentulism among young adults.

In the present study greater percentage of maxillary stock teeth 53.9% were replaced in younger age group <50 years and more mandibular teeth 63.0% loss was found in old age group >50 years. The pattern of most commonly missing teeth found in younger age was in anterior maxilla 91.4% followed by anterior mandible 50.9%, posterior maxilla 17.1% and least in posterior mandible. The greater replacement of anterior teeth could be explained on the fact that aesthetics could be the main reason behind. However, in the current study; in older age group, maximum teeth replaced in posterior maxilla 87.8% followed by posterior mandible 82.9% was found. Likewise, Amar¹⁷ and coworkers reported maximum teeth replaced in posterior arch and bilateral missing teeth were more common in patients above 56 years of age stating fact that with upsurge of age many people loose teeth on both sides of arches.

Epidemiological studies on different patterns of partial edentulism have been conducted in various geographical locations such as India, Romania, Saudi Arabia, and Jordan.²⁴⁻²⁷ The current study was conducted in Pakistan where we highlighted the most frequently demanded pattern of partial dentures thus highlighting the most common partial denture designing. Furthermore, the study emphasized on identifying the pattern of tooth loss and most vulnerable teeth that must be protected and preserved. The number of individuals with partial and complete edentulism is increasing, necessitating the understanding of the most common patterns of partial edentulism as it will be of great help to prosthodontists to have knowledge of most common patterns of tooth loss and they plan and provide effective treatment options to their patients.

CONCLUSION

In our region, partial and complete edentulism are prevalent, with a high demand for tooth replacements. Notably younger individuals often require replacement of anterior maxillary and mandibular teeth, whereas older individuals tend to need more posterior teeth replacements in both jaws.

REFERENCES

- Pandey A, Awasthi A, Saxena KK. Metallic implants with properties and latest production techniques: a review. *Advances in Materials and Processing Technologies*. 2020 Apr 2;6(2):405-40. <https://doi.org/10.1080/2374068x.2020.1731236>
- Rizzo P. A review on the latest advancements in the non-invasive evaluation/monitoring of dental and trans-femoral implants. *Biomedical Engineering Letters*. 2020 ;10(1):83-102. <https://doi.org/10.1007/s13534-019-00126-8>
- Al-Rafee MA. The epidemiology of edentulism and the associated factors: A literature Review. *J Family Med Prim Care*. 2020;30;9(4):1841-1843. <https://doi.org/10.4103/jfmpc.jfmpc.1181.19>
- Al-Angari N, Algarni S, Andijani A, Alqahtani A. Various classes of removable partial dentures: A study of prevalence among patients attending a dental and educational institute in Riyadh, Saudi Arabia. *Saudi Dent J*. 2021;33(7):656-660. <https://doi.org/10.1016/j.sdentj.2020.05.002>

5. Kossakowski PG, Wciślik W. Fiber-reinforced polymer composites in the construction of bridges: Opportunities, problems and challenges. *Fibers*. 2022;10(4):37. <https://doi.org/10.3390/fib10040037>
6. Campos FL, Kawachi I, Rhodes GAC, Sampaio AA, Chalub LLFH, Ferreira RC, et al. Brazilian adults believe that complete dentures would be the solution to the oral impacts caused by reduced dentition. *Pesqui Bras Odontopediatria Clín Integr*. 2022; 22: e200087. <https://doi.org/10.1590/pboci.2022.016>
7. Qamar K, Rizvi S H A, Yasser F, Aamir H, Ahmed RA, Muzaffar M, Naeem S. Patient Satisfaction with Quality of Dentures at Teaching Hospital of Lahore: Quality Dentures and Patients Satisfaction. *Pak J Health Sci*.2024;5(05). <https://doi.org/10.54393/pjhs.v5i05.1451>
8. 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 Med J*. 2023; 48(1): 200-203.
9. Ambikathanaya UK, Swamy KR, Gujjari AK, Tejaswi S, Shetty S, Ravi MB. Effect of acrylic removable partial denture in caries prevalence among diabetic and non-diabetic patients. *J Pharm Bio allied Sci*. 2022;14(Suppl 1): S917-S922. <https://doi.org/10.4103/jpbs.jpbs 126 22>.
10. Patel, J., Jablonski, R. & Hodson, T. Removable partial dentures: Part 1. *Br Dent J*. 2024; 237: 537-542. <https://doi.org/10.1038/s41415-024-7893-7>
11. Gupta V, Singh S, Singhal P, Gupta P, Gupta B, Kumar S. Perception, Awareness, and practice about missing teeth, prosthetic options, and knowledge about dental implants as a treatment modality in the adult population of Jharkhand state: A Hospital-Based Study. *J Pharm Bio allied Sci*. 2022 ;14(Suppl 1): S644-S648. <https://doi.org/10.4103/jpbs.jpbs 809 21>.
12. Budală DG, Lupu CI, Vasluianu RI, Ioanid N, Butnaru OM, Baciú ER. A contemporary review of clinical factors involved in speech-perspectives from a prosthodontist point of view. *Medicina*.2023;18;59(7): 1322. <https://doi.org/10.3390/medicina59071322>.
13. Takebe, J. A case series on the basic concept and design of removable partial dentures: support and bracing considerations. *BMC Oral Health*.2025;25:157 <https://doi.org/10.1186/s12903-025-05553->
14. Nono, D., Bagenda, G., Okullo, I. et al. Exploring lived experiences with tooth loss among fully edentulous patients attending Makerere University Dental Hospital, Kampala, Uganda. *BMC Oral Health* 24, 1355 (2024). <https://doi.org/10.1186/s12903-024-05150-4>
15. Khan, A. S., Zaigham, A. M., Shakoor, A., Tahir, F., Sana, A., & Ullah, N. (2022). Association of Age and Gender with Pattern of Tooth Loss. *Annals of Punjab Medical College*, 16(3), 193-196. <https://doi.org/10.29054/apmc/2022.1368>
16. Pan MY, Hsieh TC, Chen PH, Chen MY. Factors Associated with Tooth Loss in Postmenopausal Women: A Community-Based Cross-Sectional Study. *Int J Environ Res Public Health*. 2019 Oct 16;16(20):3945. PMID: 31623275; PMCID: PMC6843320. <https://doi.org/10.3390/ijerph16203945>.
17. Bhochhibhoyal A, Guragain M, Gupta SP, Dahal S, Goe K. Association of Age, Gender, and Reason of Tooth Loss with Patterns of Partial Edentulism among Patients Reporting to a Dental Teaching Hospital. *Int J Prosth Rest Dent*.2023; 13(1):23-9. <https://doi.org/10.5005/jp-journals-10019-1402>.
18. Jogeswar B, Chandana K, Rupali B, Kalyani C. Tooth loss and its risk factors among the young adults in the Kamrup (Metro) District of Assam: An Epidemiological Study. *J Indian Asso PubHealthDent*.2022;20(2):159-167. <https://doi.org/10.4103/jiaphd.jiaphd 136 21>
19. Jaleel BF, Nagarajappa R, Mohapatra AK, Ramesh G. Risk indicators associated with tooth loss among Indian adults *Oral Health Dent Manag*. 2014; 13:170-8.
20. Tomar D, Menon I, Singh A, Tyagi U, Passi D, Goyal J. Comparative study of risk indicators associated with tooth loss among adult population in urban and rural areas of Muradnagar, Ghaziabad, Uttar Pradesh, India *J Family Med Prim Care*. 2019; 8:528-34. <https://doi.org/10.4103/jfmpc.jfmpc 409 18>
21. Begum SK, Reddy VS, Krishna RV, Sudhir KM, Srinivasulu G, Ali SK. Tooth loss prevalence and risk indicators among adult people visiting community health centers in Nellore district, Andhra Pradesh: A cross-sectional study *J Indian Assoc Public Health Dent*. 2016; 14:413. <https://doi.org/10.4103/2319-5932.195829>
22. Bonakdarchian M, Ghorbanipour R, Majdzadeh F, Hojati T. Prevalence of edentulism among adults aged 35 years and over and associated factors in Yasooj Journal of Isfahan Dental School. 2011; 7:101-4
23. Mostafa F, Baig MN, Alrawaili, AM. Prevalence and pattern of partial edentulism among dental patients attending College of Dentistry, Aljouf University, Saudi Arabia. *J Int Soci Prevent Comm Dent* 2016; 6(Suppl 3): S187-S191. <https://doi.org/10.4103/2231-0762.197189>
24. Manimaran P, Kumar CD, Saisadan D, Abirami M, Kumar N, Mani J. Partial edentulism in a rural population based on Kennedy's classification: Epidemiological study. *J pharm bio sci*. 2017 ;9(Suppl 1): S34. <https://doi.org/10.4103/jpbs.jpbs 87 17>