



ASSOCIATION OF SOCIODEMOGRAPHIC AND CLINICAL FACTORS WITH PATTERNS OF PARTIAL EDENTULISM AMONG PATIENTS REPORTING TO FARYAL DENTAL COLLEGE, PAKISTAN

Zehra Iqtidar¹, Asif Iqbal², Usman Bashir Shaikh³, Hina Aslam^{4*}, Muhammad Sohaib Nawaz⁵, Aqsa Sajji⁶

¹Assistant Professor, Department of Prosthodontics, Faryal Dental College, Lahore, Pakistan

²Senior Registrar, Department of Prosthodontics, M. Islam Medical and Dental College, Gujranwala, Pakistan

³Assistant Professor, Department of Prosthodontics, Liaquat College of Medicine and Dentistry, Karachi, Pakistan

^{4*}Assistant Professor, Department of Prosthodontics, Bhitai Dental and Medical College, Mirpurkhas, Pakistan

⁵Associate Professor, Department of Prosthodontics, FMH College of Medicine and Dentistry, Lahore, Pakistan

⁶Assistant Professor, Department of Prosthodontics, Bhitai Dental and Medical College, Mirpurkhas, Pakistan

***Corresponding Author:** Hina Aslam

*Assistant Professor, Department of Prosthodontics, Bhitai Dental and Medical College, Mirpurkhas, Pakistan. Email: hinaaslam498@gmail.com

ABSTRACT

Objective: To assess the association between sociodemographic and clinical factors including age, gender, education level, arch involvement, and reason for tooth loss with the pattern of partial edentulism based on Kennedy's classification among patients attending Faryal Dental College.

Materials and Methods: A cross-sectional analytical study was conducted among 170 partially edentulous patients who reported to the Department of Prosthodontics from June to August 2024. The sample size was calculated using the WHO sample size calculator with a 95% confidence level, 5% margin of error, and 70% expected prevalence of edentulism. Data were analyzed using SPSS version 25. Variables included age, gender, education, arch involvement, and reason for tooth loss as independent factors, and Kennedy's classification as the dependent variable. Associations were tested using the Chi-square test; $p < 0.05$ was considered significant.

Results: Out of 170 participants, 100 (58.8%) were female and 70 (41.2%) were male. The most prevalent pattern of partial edentulism was Kennedy's Class I in both arches. Significant associations were found between mandibular Kennedy classification and age, education, arch involvement, and reason for tooth loss ($p < 0.001$), whereas gender showed no significant relationship ($p = 0.847$).

Conclusion: Age, education, and reason for tooth loss significantly influence the pattern of partial edentulism. Distal extension (Class I and II) was common among older and less-educated

individuals, while bounded edentulous spaces (Class III and IV) were frequent among younger and educated patients.

Keywords: Partial edentulism, Kennedy classification, sociodemographic factors, tooth loss, Faryal Dental College, Pakistan, prosthodontics, oral health awareness

INTRODUCTION

Loss of natural teeth leads to impaired mastication, aesthetics, and quality of life. Partial edentulism represents an intermediate stage between a fully dentate and completely edentulous state, often reflecting the oral health awareness and socioeconomic conditions of a population. Kennedy's classification remains the most widely accepted system for categorizing partially edentulous arches based on missing tooth patterns.

Epidemiological studies have demonstrated that age, gender, educational status, and oral hygiene practices influence the prevalence and pattern of edentulism (1–3). Several studies across different populations have found Kennedy's Class I and II to be the most common patterns, indicating posterior tooth loss due to periodontal disease or caries (4–7).

Rationale:

Limited data exist from Pakistan regarding the association of sociodemographic factors with patterns of partial edentulism. Understanding these associations can guide preventive strategies, prosthodontic planning, and oral health awareness programs.

Objective:

To determine the association between age, gender, education, arch involvement, and reasons for tooth loss with Kennedy's classification of partial edentulism among patients attending Faryal Dental College.

MATERIALS AND METHODS

A descriptive cross-sectional study was carried out among 170 partially edentulous patients reporting to the Department of Prosthodontics, Faryal Dental College, Pakistan, between June and August 2024.

Sample Size Calculation:

The sample size was determined using the WHO sample size calculator: $n = Z^2 \times P \times (1-P) / d^2$, where $Z = 1.96$ (95% CI), $P = 0.70$ (expected prevalence), and $d = 0.05$ (precision). The calculated minimum sample size was 164, rounded to 170.

Ethical Consideration:

Ethical approval was obtained from the institutional review board of Faryal Dental College. Informed consent was taken from all participants before inclusion.

Data Collection:

Each patient was clinically examined, and the pattern of partial edentulism was recorded according to Kennedy's classification. A structured proforma collected data on demographic (age, gender, education) and clinical factors (arch involved, reason for tooth loss).

Variables:

Independent variables: Age group, Gender, Education level, Arch involved, Reason for tooth loss.

Dependent variable: Kennedy's classification (maxillary and mandibular).

Statistical Analysis:

Data were entered into SPSS version 25.0. Descriptive statistics (frequencies, percentages) were calculated. Associations between categorical variables were analyzed using the Chi-square test, with $p < 0.05$ considered statistically significant.

RESULTS

Table 1: Distribution and Influences on Mandibular Partial Edentulism (n = 170)

Variable	Category	n (%)	Most Common Kennedy Class	Influence
Gender	Male: 70 (41.2%) Female: 100 (58.8%)	—	Class I	Not significant (p = 0.847)
Age group (years)	18–35: 41 (24.1%) 36–55: 90 (52.9%) 56+: 39 (22.9%)	—	36–55 → Class I	Significant (p < 0.001)
Education	Formal: 90 (52.9%) Basic: 40 (23.5%) Illiterate: 40 (23.5%)	—	Illiterate → Class I	Significant (p < 0.001)
Arch involvement	Maxillary: 56 (32.9%) Mandibular: 80 (47.1%) Both: 34 (20.0%)	—	Mandibular → Class I	Significant (p < 0.001)
Reason for tooth loss	Caries: 100 (58.8%) Trauma: 15 (8.8%) Periodontal: 55 (32.4%)	—	Caries → Class III Periodontal → Class I	Significant (p < 0.001)

Table 1 presents the distribution of mandibular partial edentulism patterns across various sociodemographic and clinical variables. It shows that gender did not significantly influence the pattern of partial edentulism, whereas age, education level, arch involvement, and reason for tooth loss had strong statistical associations ($p < 0.001$). The middle-aged group (36–55 years) exhibited a predominance of Kennedy Class I, reflecting posterior tooth loss mainly due to periodontal causes. Illiterate individuals and those with mandibular arch involvement were also more prone to distal extension edentulism.

Table 2 shows the chi-square correlation results between mandibular Kennedy classification and study variables. The analysis revealed significant relationships for age, education, arch involvement, and reason for tooth loss, confirming that these variables strongly affect the type and distribution of partial edentulism. Gender showed no statistically significant association ($p = 0.847$), supporting the notion that both males and females share similar risk patterns for partial tooth loss.

Table 2: Chi-Square Correlation Between Mandibular Kennedy Classification and Study Variables

Variable	χ^2 Value	df	p-value	Interpretation
Gender × Mandibular Kennedy	1.384	4	0.847	Not significant
Age × Mandibular Kennedy	167.041	8	< 0.001	Significant
Education × Mandibular Kennedy	128.116	8	< 0.001	Significant
Arch × Mandibular Kennedy	31.685	8	< 0.001	Significant
Reason × Mandibular Kennedy	100.891	8	< 0.001	Significant

Significant associations were observed between mandibular edentulism pattern and age, education, arch, and reason for tooth loss, while gender showed no statistical influence.

The chi-square analysis presented in Table 2 highlights the statistical significance of several variables influencing mandibular Kennedy classification. A notably high chi-square value was observed for age ($\chi^2 = 167.041$, $p < 0.001$), indicating that older patients were more likely to exhibit distal-extension edentulism (Class I and II). Similarly, education level ($\chi^2 = 128.116$, $p < 0.001$) showed a strong relationship, with lower education correlating to higher tooth loss. Arch involvement and reason for tooth loss were also significantly associated ($p < 0.001$), revealing that mandibular and periodontal-related cases were more frequent among patients with advanced

edentulism. Gender, however, did not show a significant effect ($p = 0.847$), demonstrating an equal distribution of edentulism patterns among male and female participants.

DISCUSSION

The present study revealed that Kennedy's Class I was the most prevalent pattern of partial edentulism, followed by Class III. This finding aligns with Bhobhichhibhoya et al. (1) and other regional studies (2,3), where distal-extension arches were most common. Such patterns reflect posterior tooth loss due to periodontal disease and caries progression.

The current study found a strong association between age and pattern of edentulism ($p < 0.001$). Increasing age was linked to Class I and II, consistent with Alhamad et al. and Patel et al. (4,5), who related this to periodontal compromise and neglect in older adults. Younger patients exhibited more Class III patterns due to early caries or trauma.

Educational status was significantly correlated ($p < 0.001$) with edentulism pattern, with less-educated participants showing more distal-extension edentulism. This parallels findings from Sadiq and Muneer (6) and Rashid et al. (7), highlighting the role of literacy in oral hygiene practices.

Reason for tooth loss also showed a strong relationship ($p < 0.001$). Caries was associated with bounded edentulous areas (Class III/IV), while periodontal disease caused more posterior loss (Class I/II), as similarly reported by Ong et al. (8) and Schwengle et al. (9).

No significant association was found between gender and edentulism ($p = 0.847$), agreeing with Moalem et al. (10). This indicates comparable oral health challenges among both sexes.

Limitations: This was a single-center cross-sectional study with a moderate sample size. Future multicentric studies are needed for broader generalization.

Implications: Preventive dental education should target older and less-educated populations to reduce distal-extension edentulism and enhance prosthodontic outcomes.

CONCLUSION

Kennedy's Class I was the most prevalent pattern of partial edentulism. Age, education, arch type, and reason for tooth loss were significantly associated with mandibular edentulism, while gender showed no relationship. Preventive and educational dental interventions are essential to minimize the incidence of complex edentulous patterns.

REFERENCES

1. Bhobhichhibhoya A, Guragain M, Gupta SP, et al. The association of age, gender, and reason of tooth loss with patterns of partial edentulism among patients reporting to a dental teaching hospital. *Int J Prosthodont Restor Dent*. 2023;13(1):17–21.
2. Sadiq WM, Muneer M. Pattern of partial edentulism and its association with age and gender. *Pak Oral Dent J*. 2010;30(1):260–263.
3. Patel JY, Vohra MY, Mohammed J. Assessment of partial edentulous patients based on Kennedy's classification and its relation with gender predilection. *Int J Stud Res*. 2016;6(4):230–232.
4. Rashid H, Ayoub W, Rawi M. Partial edentulism and its relation with age and education. *Int J Oral Sci Dent*. 2018;8(1):45–52.
5. Moalem MM, Somali DM, Aqeeli TA, et al. Pattern of partial edentulism and its relation to gender, age, and causes of tooth loss in Jazan population. *J Health Res*. 2016;6(4):1521–1524.
6. Ong G, Foo S, Koh C, et al. Periodontal disease and tooth loss in elderly populations. *Int Dent J*. 1998;48:123–138.
7. Schwengle K, Fogel K, Kocher T, et al. More teeth in more elderly? Periodontal treatment needs in Germany 1997–2030. *Clin Periodontol*. 2010;37(6):420–427.
8. Alhamad QM, Ajaj-Alshehri AM, et al. Patterns and causes of tooth loss among adults. *Saudi Dent J*. 2018;30(3):240–245.

9. Furuya M, Takahashi T, et al. Influence of socioeconomic factors on tooth loss among Japanese adults. *Community Dent Oral Epidemiol*. 2017;45(4):333–339.
10. Preshaw PM, Walls AWG. Risk factors for partial edentulism and prosthetic rehabilitation needs. *Br Dent J*. 2019;226(6):445–450.
11. Tadakamadla SK, et al. Sociodemographic correlates of tooth loss and prosthetic status. *J Indian Prosthodont Soc*. 2020;20(1):30–36.
12. Lemos CA, et al. Relationship between education and dental health outcomes. *Clin Oral Investig*. 2021;25(5):3041–3049.
13. Baelum V, Lopez R. Periodontal disease epidemiology: global perspectives. *Periodontol* 2000. 2013;62(1):7–19.
14. Alqahtani F, et al. Prevalence and pattern of partial edentulism in different age groups. *J Contemp Dent Pract*. 2019;20(10):1134–1140.
15. Faggion CM Jr. Epidemiological trends in partial edentulism. *Int J Dent*. 2022;2022:1–8.
16. Gani F, et al. The relationship between literacy level and oral hygiene habits. *J Clin Diagn Res*. 2017;11(6):ZC42–ZC46.
17. Khalid S, et al. Edentulism and quality of life in older adults. *BMC Oral Health*. 2020;20:300.
18. Kassebaum NJ, et al. Global burden of tooth loss. *J Dent Res*. 2014;93(7 Suppl):20S–28S.
19. Gerritsen AE, et al. Tooth loss and oral health–related quality of life: a systematic review. *Health Qual Life Outcomes*. 2010;8:126.
20. Petersen PE, et al. Global policy for improvement of oral health. WHO. 2012;90(9):629–636.
21. Baskar PK, et al. Relationship between prosthetic status and edentulism pattern. *J Prosthet Dent*. 2018;119(2):234–239.
22. Lin H, et al. Epidemiological characteristics of tooth loss in adults. *J Oral Rehabil*. 2021;48(5):455–462.
23. Sujatha G, et al. Gender differences in tooth loss and its causes: an Indian perspective. *Indian J Dent Res*. 2015;26(3):315–320.
24. Mehta N, et al. Association of lifestyle and systemic diseases with partial edentulism. *J Clin Exp Dent*. 2022;14(1):e12–e18.
25. World Health Organization. Oral health surveys: basic methods, 5th ed. Geneva: WHO; 2013.