Trends in Edentulism: A Cross Sectional Community Based Study

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ABSTRACT:

Background:

Edentulism remains a significant public health concern, reflecting the cumulative impact of oral diseases, socioeconomic disparities, behavioral factors, and access to dental care. Understanding the determinants of tooth loss is essential for planning effective preventive and rehabilitative strategies.

Objective:

To assess the prevalence of partial and complete edentulism and to evaluate its association with sociodemographic characteristics, tobacco use, oral hygiene practices, and dental service utilization among adult participants.

Materials & Methods:

A cross-sectional study was conducted among 500 adult participants selected using a predefined sampling strategy. Data were collected using a structured questionnaire to record demographic details, educational and socioeconomic status, tobacco consumption habits, oral hygiene practices, and dental visit patterns. Clinical examination was performed to assess dentition status, which was categorized as dentate, partially edentulous, or completely edentulous. Data were analyzed using IBM SPSS Statistics version 26.0. Associations between dentition status and independent variables were assessed using the Chi-square test. Multivariable logistic regression analysis was performed to identify independent predictors of edentulism. Statistical significance was set at $p < 0.05$.

Results:
Of the 500 participants, 47.2% were dentate, 40.8% were partially edentulous, and 12.0% were completely edentulous. The prevalence and severity of edentulism increased significantly with advancing age ($p < 0.001$). Higher rates of edentulism were observed among females, individuals with lower educational attainment, lower socioeconomic status, tobacco users, and those with irregular or no dental visits. Multivariable logistic regression analysis revealed that age ≥60 years Adjusted Odds Ratios (AOR = 8.92), lower socioeconomic status (AOR = 3.11), tobacco use (AOR = 2.58), irregular dental visits (AOR = 2.14), and lower educational status (AOR = 1.96) were significant independent predictors of edentulism ($p < 0.05$).

Conclusion:
Edentulism was highly prevalent in the study population and was significantly associated with advancing age, socioeconomic disadvantage, tobacco use, low educational status, and poor dental service utilization. These findings highlight the need for targeted preventive oral health programs, tobacco cessation initiatives, and improved access to regular dental care, particularly among socioeconomically disadvantaged groups.

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Keywords: Community-based study, Cross-sectional study, Edentulism, Oral health, Tooth loss

Introduction

Oral health is a fundamental element of overall health, playing a vital role in adequate nutrition, effective communication, social functioning, and psychological well-being. Tooth retention throughout life is considered an important indicator of successful oral health care. Edentulism, characterized by the absence of natural teeth, reflects the cumulative effects of oral diseases, behavioral factors, and inadequacies in dental care delivery over time. Despite notable progress in preventive and restorative dentistry, complete and partial tooth loss continues to pose a substantial public health challenge, particularly in economically disadvantaged and underserved populations [1, 2].

The etiology of tooth loss is multifactorial, with dental caries and periodontal disease being the primary causes, compounded by trauma, delayed treatment, and limited availability or utilization of dental services. The loss of teeth results in functional impairments such as reduced masticatory efficiency and speech difficulties, along with changes in facial appearance. These alterations may lead to compromised nutritional intake, social withdrawal, and diminished self-esteem, ultimately exerting a negative impact on quality of life. In older adults, edentulism has also been associated with broader systemic health consequences, including frailty and chronic disease burden [3, 4].

Patterns of edentulism vary considerably among populations and are closely linked to sociodemographic and economic determinants. Advancing age, lower levels of education, reduced income, and inadequate health-seeking behavior have consistently been associated with higher rates of tooth loss. In addition, behavioral factors such as tobacco use, poor oral hygiene practices, and irregular dental visits further increase susceptibility to edentulism. These disparities highlight the influence of social determinants of health and underscore the

persistent inequalities in oral health status within communities [5, 6].

Epidemiological investigations conducted at the community level are essential for quantifying the burden of edentulism and understanding its distribution across different population groups. Such evidence provides a foundation for oral health surveillance, priority setting, and the development of targeted preventive and rehabilitative interventions. However, region-specific data on edentulism and its associated factors remain limited in many settings, restricting the ability to plan effective public health strategies [1, 5].

In this context, the present community-based cross-sectional study was designed to estimate the prevalence and distribution of edentulism and to explore its relationship with selected sociodemographic and behavioral variables. The findings aim to contribute to existing evidence and support the formulation of comprehensive oral health promotion and disease prevention programs tailored to community needs.

Materials and Methods

Study Design and Study Population

This study employed a cross-sectional observational design and included a total of 500 adult participants. Individuals aged 18 years and above who provided informed consent were recruited for the study. Only participants with complete questionnaire responses and those who underwent a clinical oral examination were included in the final analysis.

Data Collection

Information was obtained using a prevalidated structured questionnaire administered through direct face-to-face interviews. The questionnaire was designed to collect data on sociodemographic variables, including age and gender, as well as educational level and socioeconomic status. Additional information regarding tobacco use, oral hygiene practices, and patterns of dental attendance was also recorded.

Assessment of Dentition Status

A clinical oral examination was conducted to evaluate the dentition status of each participant. Based on the clinical findings, participants were classified into the following categories:

- **Dentate:** Presence of all natural teeth
- **Partially edentulous:** Absence of one or more natural teeth
- **Completely edentulous:** Absence of all natural teeth

Examiner Calibration

Prior to the study, the examiner was trained and calibrated to ensure consistency in clinical recordings. Intra-examiner reliability was assessed by re-examining 10% of the study participants, and the agreement was found to be satisfactory.

Ethical Considerations

Ethical approval for the study was obtained from the Institutional Ethics Committee. Written informed consent was obtained from all participants before data collection. Confidentiality of participant information was strictly maintained throughout the study.

Statistical Analysis

The prevalence of partial and complete edentulism was calculated and presented as percentages. Associations between dentition status (dentate, partially edentulous, and completely edentulous) and independent variables such as age group, gender, educational status, socioeconomic status, tobacco use, and dental visit pattern were evaluated using the Pearson Chi-square test. When the assumptions for the Chi-square test were not satisfied, Fisher's Exact test was considered as an alternative. To identify the independent predictors of edentulism, multivariable binary logistic regression analysis was performed. Variables demonstrating statistical significance in the bivariate analysis or considered clinically relevant were entered into the regression model. The strength of association was expressed as Adjusted Odds Ratios (AORs) with corresponding 95% Confidence Intervals (95% CIs). The goodness-of-fit of the logistic

regression model was assessed using the Hosmer–Lemeshow goodness-of-fit test, and multicollinearity among independent variables was evaluated using the Variance Inflation Factor (VIF) before model interpretation. All statistical tests were two-tailed, and a p-value <0.05 was considered statistically significant throughout the analysis. Results were presented in the form of tables, graphs, percentages, Chi-square values, adjusted odds ratios, 95% confidence intervals, and p-values to facilitate comprehensive interpretation of the study findings.

Results:

Table 1 & Figure 1 present the distribution of the study participants according to age group. A total of 500 participants were included in the study. The largest proportion of participants belonged to the 30–44 years age group, comprising 145 (29.0%) individuals, followed by the 45–59 years age group with 135 (27.0%) participants. Participants aged ≥60 years accounted for 115 (23.0%) of the study population, while the 18–29 years age group included 105 (21.0%) participants. Overall, the study population was fairly evenly distributed across all age groups, with a slightly higher representation of middle-aged adults (30–44 years).

Table 1: Distribution of Study Participants According to Age Group

Age Group (Years)	N	%
18–29	105	21.0
30–44	145	29.0
45–59	135	27.0
≥60	115	23.0
Total	**500**	**100.0**

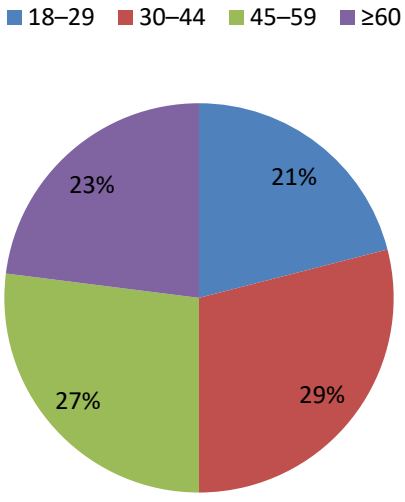

Figure 1: Age-wise distribution of study participants

Table 2 & Figure 2 show the distribution of the study participants according to gender. Of the total 500 participants**,** 252 (50.4%) were female and 248 (49.6%) were male. The gender distribution was nearly equal, with a marginal predominance of female participants. This

balanced representation of both genders enhances the comparability of gender-based analyses conducted in the study.

Table 2: Distribution According to Gender

Gender	N	%
Male	248	49.6
Female	252	50.4
Total	**500**	**100.0**

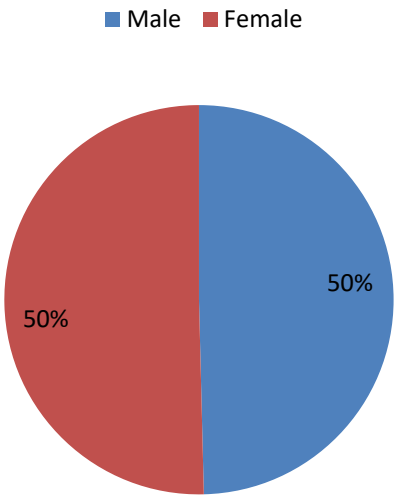

Figure 2: Gender distribution of study participants

Table 3 & Figure 3 depict the distribution of the study participants according to their educational status. Among the 500 participants, the highest proportion had attained secondary education, accounting for 144 (28.8%) participants, followed by those with higher secondary education, comprising 118 (23.6%) participants. Primary education and graduate-level education were each reported by 82 (16.4%) participants. Illiterate individuals constituted 48 (9.6%) of the study population, while postgraduates represented the smallest educational category with 26 (5.2%) participants. Overall, the majority of the participants had completed at least secondary-level education, indicating a moderate educational profile within the study population.

Table 3: Educational Status

Education	N	%
Illiterate	48	9.6
Primary	82	16.4
Secondary	144	28.8
Higher Secondary	118	23.6
Graduate	82	16.4
Postgraduate	26	5.2
Total	**500**	**100.0**

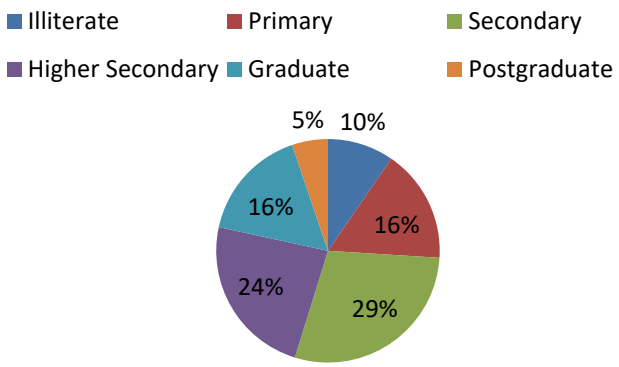

Figure 3: Educational status distribution of study participants

Table 4 & Figure 4 present the distribution of the study participants according to socioeconomic status. Among the 500 participants, the majority belonged to the lower middle socioeconomic class, comprising 176 (35.2%) participants, followed by the upper lower class with 158 (31.6%) participants. The upper middle class accounted for 74 (14.8%) participants, while 60 (12.0%) participants belonged to the lower socioeconomic class. The upper socioeconomic class constituted the smallest proportion of the study population, with 32 (6.4%) participants. Overall, nearly two-thirds of the participants were from the lower middle and upper lower socioeconomic strata, indicating that the study population was predominantly from middle- to lower-income groups.

Table 4: Socioeconomic Status

Class	**N**	**%**
Upper	32	6.4
Upper Middle	74	14.8
Lower Middle	176	35.2
Upper Lower	158	31.6
Lower	60	12.0
Total	**500**	**100.0**

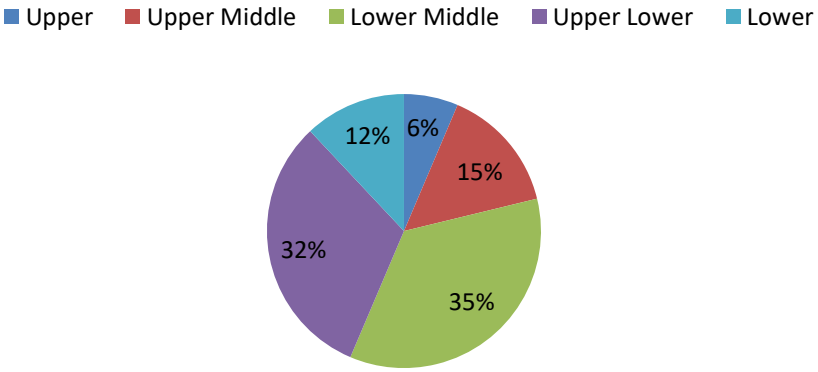

Figure 4: Socioeconomic status distribution of study participants

Table 5 & Figure 5 illustrate the distribution of the study participants according to tobacco consumption habits. Of the 500 participants, the majority, 262 (52.4%), reported no history of

tobacco use. Among tobacco users, 112 (22.4%) participants consumed smokeless tobacco, making it the most common form of tobacco use, followed by 86 (17.2%) participants who were smokers. A smaller proportion of participants, 40 (8.0%), reported using both smoking and smokeless forms of tobacco. Overall, nearly half of the study population **(**47.6%**)** reported some form of tobacco consumption, highlighting a considerable prevalence of tobacco use among the participants.

Table 5: Tobacco Consumption

Habit	**N**	**%**
No tobacco	262	52.4
Smoking	86	17.2
Smokeless	112	22.4
Both	40	8.0
Total	**500**	**100.0**

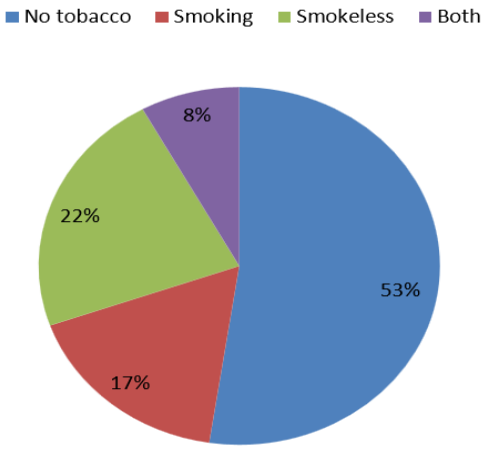

Figure 5: **Distribution of study participants according to tobacco consumption**

Table 6 & Figure 6 present the distribution of the study participants according to their oral hygiene practices. Among the 500 participants, the majority, 406 (81.2%), reported using a toothbrush and toothpaste as their primary method of oral hygiene. Finger cleaning was practiced by 48 (9.6%) participants, while 24 (4.8%) participants used other oral hygiene aids. The least common method was the use of a neem stick, reported by 22 (4.4%) participants. Overall, the findings indicate that the vast majority of the study population practiced oral hygiene using a toothbrush and toothpaste, reflecting a high level of adoption of conventional oral hygiene methods.

Table 6: Oral Hygiene Practice

Practice	**N**	**%**
Toothbrush & Toothpaste	406	81.2
Finger	48	9.6
Neem Stick	22	4.4
Others	24	4.8
Total	**500**	**100.0**

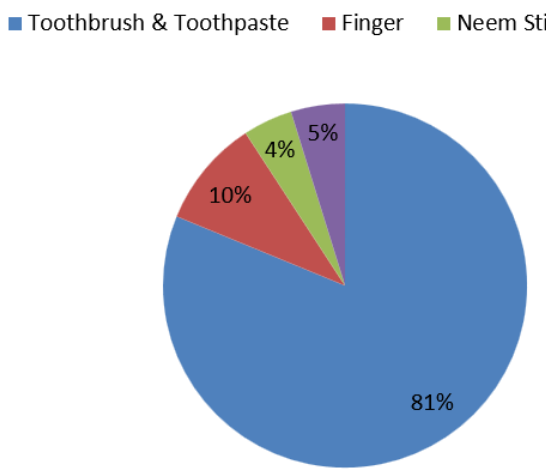

Figure 6: Distribution of study participants according to oral hygiene practices

Table 7 & Figure 7 present the distribution of the study participants according to their pattern of dental visits. Among the 500 participants, the largest proportion, 214 (42.8%), reported visiting a dentist only when experiencing pain or discomfort. This was followed by 138 (27.6%) participants who visited the dentist occasionally, while 86 (17.2%) participants reported regular dental visits for routine check-ups. A total of 62 (12.4%) participants had never visited a dentist. Overall, the findings indicate that the majority of the study participants sought dental care primarily on a symptomatic basis rather than for preventive or routine oral health maintenance.

Table 7: Dental Visit Pattern

Frequency	**N**	**%**
Regular	86	17.2
Occasional	138	27.6
Only During Pain	214	42.8
Never	62	12.4
Total	**500**	**100.0**

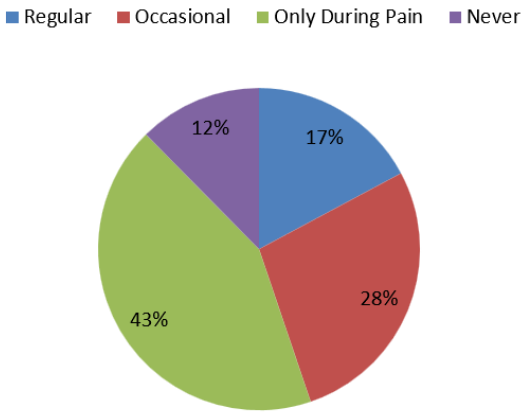

Figure 7: Distribution of study participants according to pattern of dental visits

Table 8 & Figure 8 present the distribution of the study participants according to their dentition status. Of the 500 participants included in the study, 236 (47.2%) were dentate, indicating the presence of a complete natural dentition. Partial edentulism was observed in 204 (40.8%) participants, while 60 (12.0%) participants were found to be completely edentulous. Overall, more than half of the study population **(**52.8%**)** exhibited some degree of tooth loss, with partial edentulism being considerably more prevalent than complete edentulism. These findings suggest that tooth loss remains a common oral health concern among the study population, emphasizing the need for preventive oral health measures and timely restorative dental care.

Table 8: Dentition Status

Status	**N**	**%**
Dentate	236	47.2
Partially Edentulous	204	40.8
Completely Edentulous	60	12.0
Total	**500**	**100.0**

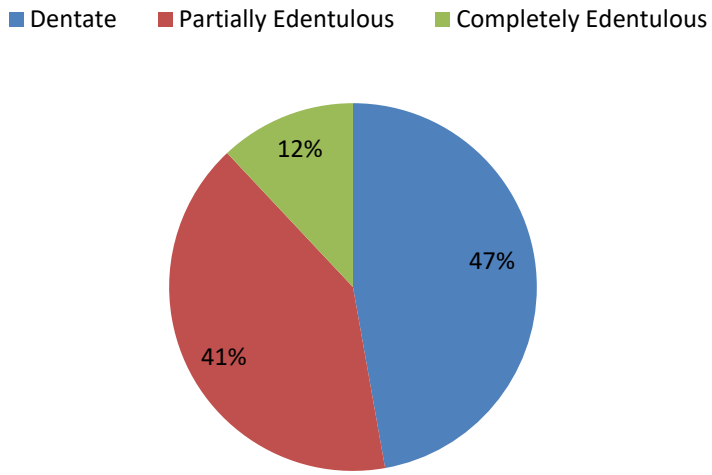

Figure 8: Distribution of study participants according to dentition status

Table 9 & Figure 9 depict the association between age group and dentition status among the study participants. A progressive increase in the prevalence of edentulism was observed with advancing age. Among participants aged 18–29 years, 102 (97.1%) were dentate, while only 3 (2.9%) were partially edentulous, and none were completely edentulous. In the 30–44 years age group, 118 (81.4%) participants were dentate and 27 (18.6%) were partially edentulous, with no cases of complete edentulism.

In the 45–59 years age group, the majority of participants were partially edentulous (109; 80.7%), whereas 16 (11.9%) remained dentate and 10 (7.4%) were completely edentulous. Among participants aged ≥60 years, 65 (56.5%) were partially edentulous and 50 (43.5%) were completely edentulous, while no participant retained a completely dentate status.

The association between age group and dentition status was found to be highly statistically significant ($\chi^2 = 318.64$, $p < 0.001$), indicating that the prevalence and severity of

edentulism increased significantly with advancing age.

Table 9: Association between Age and Edentulism

Age Group	Dentate N (%)	Partial N (%)	Complete N (%)
18–29	102 (97.1)	3 (2.9)	0
30–44	118 (81.4)	27 (18.6)	0
45–59	16 (11.9)	109 (80.7)	10 (7.4)
≥60	0	65 (56.5)	50 (43.5)

$\chi^2 = 318.64$, $P < 0.001$

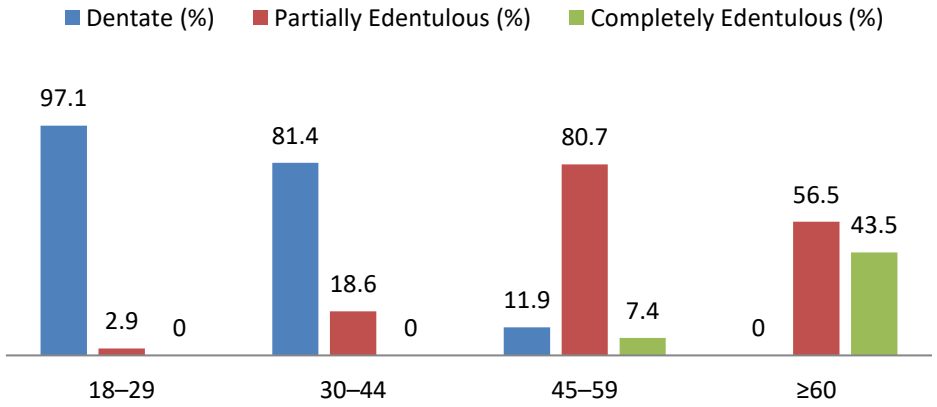

Figure 9: Association between age group and dentition status among study participants

Table 10 & Figure 10 present the association between gender and dentition status among the study participants. Among the 248 male participants, 126 (50.8%) were dentate, 101 (40.7%) were partially edentulous, and 21 (8.5%) were completely edentulous. In comparison, among the 252 female participants, 110 (43.7%) were dentate, 103 (40.9%) were partially edentulous, and 39 (15.5%) were completely edentulous.

Although the prevalence of partial edentulism was comparable between males and females, complete edentulism was observed more frequently among female participants (15.5%) than among males (8.5%). Conversely, a higher proportion of males retained a completely dentate status compared to females (50.8% vs. 43.7%). The association between gender and dentition status was found to be statistically significant ($\chi^2 = 8.94$, $p = 0.011$), indicating that gender had a significant influence on the distribution of edentulism in the study population.

Table 10: Association Between Gender and Edentulism

Gender	Dentate N (%)	Partially Edentulous N (%)	Completely Edentulous N (%)
Male (n = 248)	126 (50.8)	101 (40.7)	21 (8.5)
Female (n = 252)	110 (43.7)	103 (40.9)	39 (15.5)

$\chi^2 = 8.94$, P = 0.011

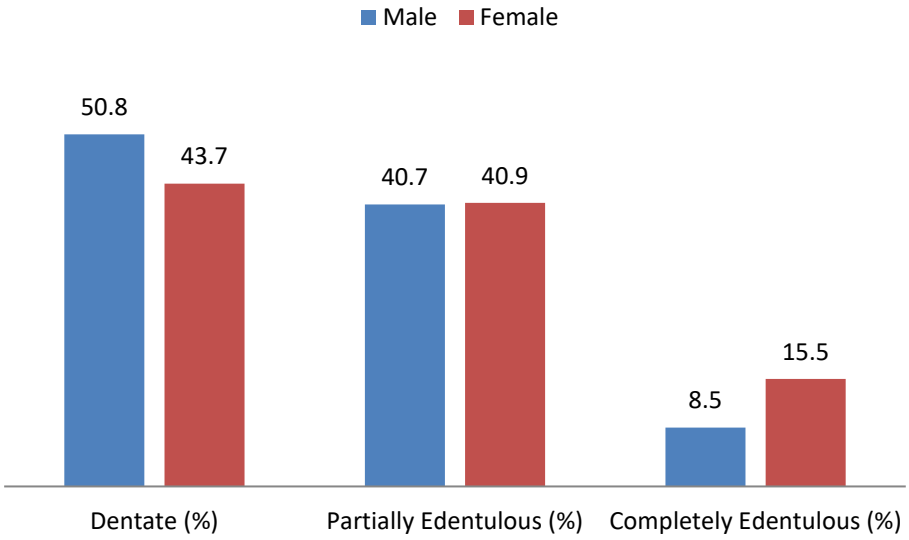

Figure 10: Association between gender and dentition status among study participants

Table 11 & Figure 11 present the association between educational status and dentition status among the study participants. A significant inverse relationship was observed between educational attainment and the prevalence of edentulism. Among illiterate participants, only 8 (16.7%) were dentate, while 24 (50.0%) were partially edentulous and 16 (33.3%) were completely edentulous. Similarly, among participants with primary education, 24 (29.3%) were dentate, 44 (53.7%) were partially edentulous, and 14 (17.1%) were completely edentulous.

Among those with secondary education, 58 (40.3%) participants were dentate, 72 (50.0%) were partially edentulous, and 14 (9.7%) were completely edentulous. Participants with higher secondary education demonstrated better dentition status, with 64 (54.2%) remaining dentate, 50 (42.4%) being partially edentulous, and only 4 (3.4%) being completely edentulous.

The highest proportion of dentate individuals was observed among graduates (60; 73.2%) and postgraduates (22; 84.6%), with no cases of complete edentulism reported in either group. These findings indicate that higher educational attainment was associated with better preservation of natural dentition and a lower prevalence of both partial and complete edentulism. The association between educational status and dentition status was found to be highly statistically significant ($\chi^2 = 92.31$, $p < 0.001$).

Table 11: Association Between Educational Status and Edentulism

Education	Dentate N (%)	Partially Edentulous N (%)	Completely Edentulous N (%)
Illiterate (n = 48)	8 (16.7)	24 (50.0)	16 (33.3)
Primary (n = 82)	24 (29.3)	44 (53.7)	14 (17.1)
Secondary (n = 144)	58 (40.3)	72 (50.0)	14 (9.7)
Higher Secondary (n = 118)	64 (54.2)	50 (42.4)	4 (3.4)
Graduate (n = 82)	60 (73.2)	22 (26.8)	0 (0.0)
Postgraduate (n = 26)	22 (84.6)	4 (15.4)	0 (0.0)

$\chi^2 = 92.31$, $P < 0.001$

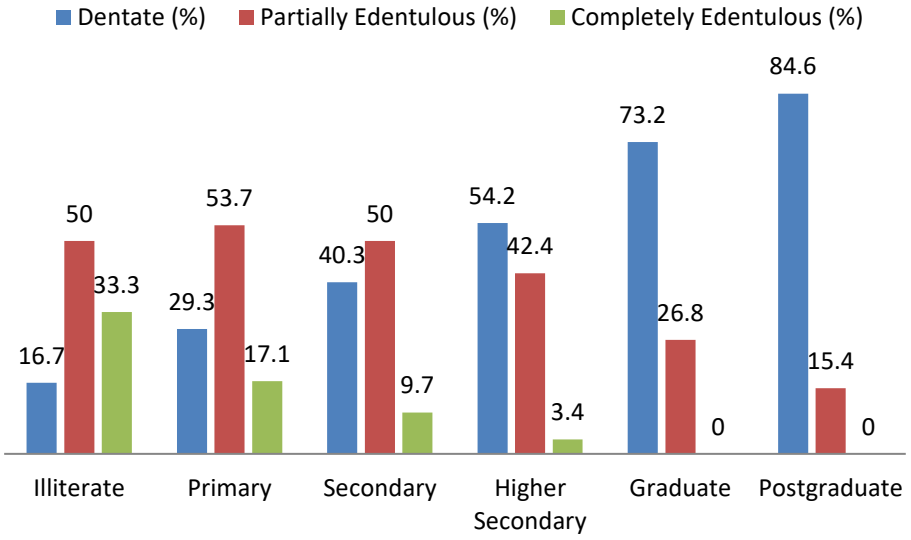

Figure 12: Association between study variables as depicted in the analysis

Table 12 & Figure 12 present the association between socioeconomic status and dentition status among the study participants. A clear socioeconomic gradient was observed, with the prevalence of edentulism increasing as socioeconomic status declined. Among participants belonging to the upper socioeconomic class, 30 (93.8%) were dentate and 2 (6.3%) were partially edentulous, while no cases of complete edentulism were recorded. Similarly, in the upper middle class, 60 (81.1%) participants were dentate and 14 (18.9%) were partially edentulous, with no participants being completely edentulous.

Among participants in the lower middle socioeconomic class, 98 (55.7%) were dentate, 68 (38.6%) were partially edentulous, and 10 (5.7%) were completely edentulous. In the upper lower class, the majority of participants were partially edentulous (94; 59.5%), while 42 (26.6%) were dentate and 22 (13.9%) were completely edentulous. The lower socioeconomic class exhibited the poorest dentition status, with only 6 (10.0%) participants remaining dentate, 26 (43.3%) being partially edentulous, and 28 (46.7%) being completely edentulous.

The findings demonstrate that participants from lower socioeconomic strata had a substantially higher prevalence of both partial and complete edentulism compared with those from higher socioeconomic groups. This association was found to be highly statistically significant ($\chi^2 = 118.25$, $p < 0.001$), indicating that socioeconomic status was a significant determinant of dentition status in the study population.

Table 12: Association Between Socioeconomic Status and Edentulism

Socioeconomic Status	Dentate N (%)	Partially Edentulous N (%)	Completely Edentulous N (%)
Upper (n = 32)	30 (93.8)	2 (6.3)	0 (0.0)
Upper Middle (n = 74)	60 (81.1)	14 (18.9)	0 (0.0)
Lower Middle (n = 176)	98 (55.7)	68 (38.6)	10 (5.7)
Upper Lower (n = 158)	42 (26.6)	94 (59.5)	22 (13.9)
Lower (n = 60)	6 (10.0)	26 (43.3)	28 (46.7)

$\chi^2 = 118.25$, $P < 0.001$

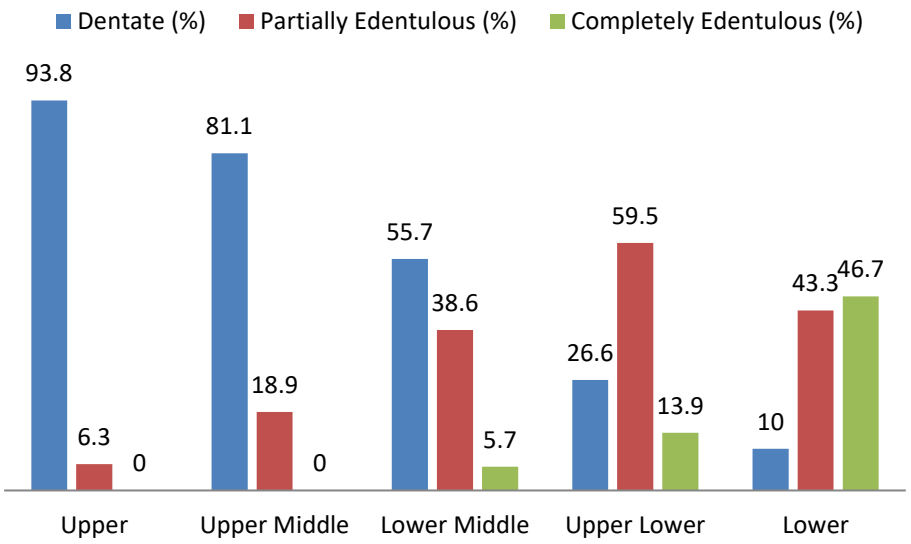

Figure 12: Association between socioeconomic status and dentition status among study participants

Table 13 & Figure 13 present the association between tobacco use and dentition status among the study participants. A significant relationship was observed between tobacco consumption and the prevalence of edentulism. Among participants with no history of tobacco use, the majority, 162 (61.8%), were dentate, while 90 (34.4%) were partially edentulous and only 10 (3.8%) were completely edentulous.

Among smokers**,** 28 (32.6%) participants were dentate, 48 (55.8%) were partially edentulous, and 10 (11.6%) were completely edentulous. Similarly, among participants who used smokeless tobacco, 34 (30.4%) were dentate, 60 (53.6%) were partially edentulous, and 18 (16.1%) were completely edentulous. The highest prevalence of complete edentulism was observed among participants who used both smoking and smokeless forms of tobacco, where 22 (55.0%) were completely edentulous, while only 12 (30.0%) remained dentate and 6 (15.0%) were partially edentulous.

Overall, the prevalence of complete edentulism increased progressively with tobacco use and was highest among dual tobacco users. Conversely, participants who did not consume tobacco demonstrated the highest proportion of dentate individuals and the lowest prevalence of complete edentulism. The association between tobacco use and dentition status was found to be highly statistically significant **(**$\chi^2 = 82.74$, $p < 0.001$**)**, indicating that tobacco consumption was significantly associated with an increased prevalence of edentulism in the study population.

Table 13: Association Between Tobacco Use and Edentulism

Tobacco Habit	**Dentate N (%)**	**Partially Edentulous N (%)**	**Completely Edentulous N (%)**
No Tobacco (N = 262)	162 (61.8)	90 (34.4)	10 (3.8)
Smoking (N= 86)	28 (32.6)	48 (55.8)	10 (11.6)
Smokeless (N = 112)	34 (30.4)	60 (53.6)	18 (16.1)
Both (N = 40)	12 (30.0)	6 (15.0)	22 (55.0)

$\chi^2 = 82.74$, $P < 0.001$

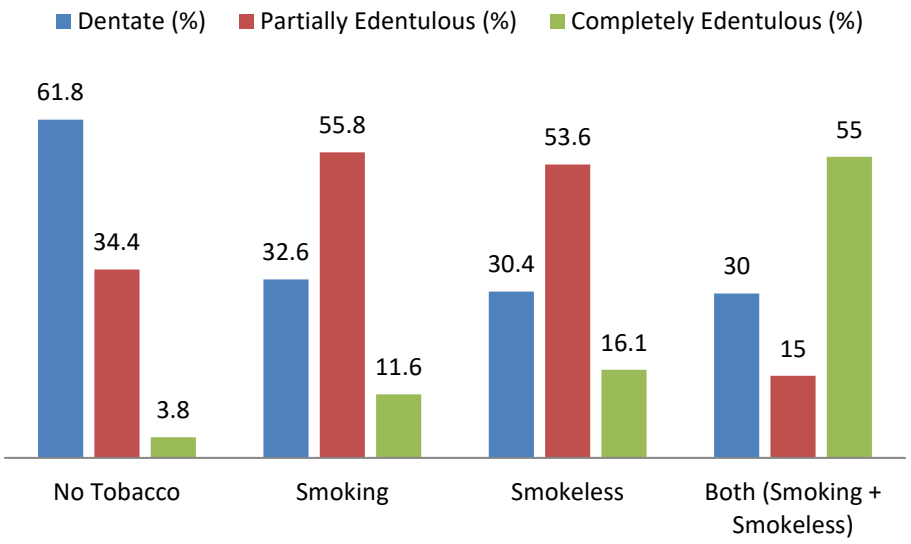

Figure 13: Association between tobacco use and dentition status among study participants

Table 14 & Figure 14 present the association between dental visit pattern and dentition status among the study participants. A significant relationship was observed between the frequency of dental visits and the prevalence of edentulism. Among participants who reported regular dental visits, the majority, 72 (83.7%), were dentate, while 12 (14.0%) were partially edentulous and only 2 (2.3%) were completely edentulous. Similarly, among those who visited the dentist occasionally, 92 (66.7%) participants were dentate, 42 (30.4%) were partially edentulous, and 4 (2.9%) were completely edentulous.

In contrast, participants who sought dental care only during pain exhibited a markedly higher prevalence of tooth loss, with 120 (56.1%) being partially edentulous and 24 (11.2%) completely edentulous, while only 70 (32.7%) retained a complete natural dentition. The poorest dentition status was observed among participants who had never visited a dentist, where only 2 (3.2%) participants were dentate, whereas 30 (48.4%) were partially edentulous and an equal proportion, 30 (48.4%), were completely edentulous.

These findings indicate that regular utilization of dental services was associated with better preservation of natural dentition, whereas irregular or absent dental attendance was associated with a significantly higher prevalence of both partial and complete edentulism. The association between dental visit pattern and dentition status was found to be highly statistically significant ($\chi^2 = 146.81$, $p < 0.001$), highlighting the important role of regular preventive dental care in reducing tooth loss.

Table 14: Association Between Dental Visit Pattern and Edentulism

Dental Visit Pattern	Dentate N (%)	Partially Edentulous N (%)	Completely Edentulous N (%)
Regular (n = 86)	72 (83.7)	12 (14.0)	2 (2.3)
Occasional (n = 138)	92 (66.7)	42 (30.4)	4 (2.9)
Only During Pain (n = 214)	70 (32.7)	120 (56.1)	24 (11.2)
Never (n = 62)	2 (3.2)	30 (48.4)	30 (48.4)

$\chi^2 = 146.81$, $P < 0.001$

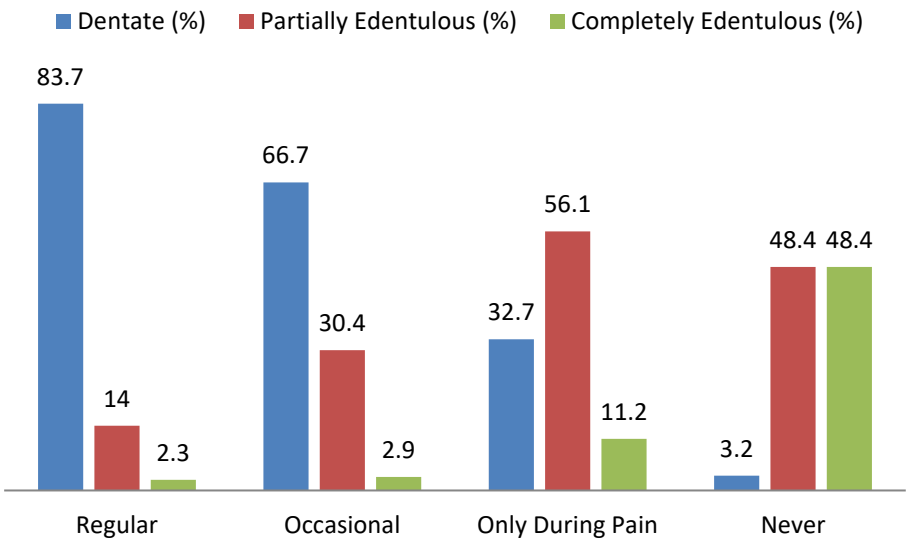

Figure 14: Association between dental visit pattern and dentition status among study participants

Table 15 presents the multivariable logistic regression analysis performed to identify independent predictors of edentulism after adjusting for potential confounding variables. Participants aged ≥60 years had the highest likelihood of being edentulous, with an AOR of 8.92 (95% CI: 5.21–15.31, $p < 0.001$), indicating that older adults were nearly nine times more likely to experience edentulism compared to younger participants.

Participants belonging to the lower socioeconomic group were approximately 3.11 times more likely to be edentulous than those from higher socioeconomic classes (95% CI: 1.89–5.14, $p < 0.001$). Similarly, tobacco use was identified as a significant independent predictor of edentulism, with tobacco users demonstrating 2.58 times higher odds of tooth loss compared with non-users (95% CI: 1.63–4.09, $p < 0.001$).

Participants with irregular dental visit patterns had a significantly increased likelihood of edentulism, with an AOR ratio of 2.14 (95% CI: 1.29–3.55, $p = 0.003$). Likewise, individuals with lower educational attainment had approximately 1.96 times greater odds of being edentulous compared to those with higher educational qualifications (95% CI: 1.18–3.27, $p = 0.009$).

Although female participants demonstrated a higher AOR = 1.28 for edentulism compared to males, the association was not statistically significant (95% CI: 0.84–1.94, $p = 0.241$). Overall, advancing age, lower socioeconomic status, tobacco use, irregular dental attendance, and lower educational level emerged as significant independent predictors of edentulism, whereas gender did not independently influence the likelihood of edentulism after adjustment for other variables.

Table 15: Illustrative Logistic Regression

Variable	Adjusted OR	95% CI	P value
Age ≥60 years	8.92	5.21–15.31	<0.001
Lower Socioeconomic Status	3.11	1.89–5.14	<0.001
Tobacco Use	2.58	1.63–4.09	<0.001
Irregular Dental Visits	2.14	1.29–3.55	0.003

Low Education	1.96	1.18–3.27	0.009
Female Gender	1.28	0.84–1.94	0.241

Discussion

The present community-based cross-sectional investigation evaluated the prevalence and pattern of edentulism and explored its relationship with selected sociodemographic and behavioral determinants. The results confirm that edentulism continues to be a substantial oral health issue, disproportionately affecting older individuals and those from disadvantaged socioeconomic backgrounds. This pattern highlights edentulism as an indicator of accumulated oral disease and persistent inequalities in access to oral health care services.

The progressive increase in edentulism with advancing age observed in this study is in agreement with earlier epidemiological evidence, which attributes higher tooth loss among elderly populations to long-term exposure to dental caries, periodontal disease, and inadequate preventive care. Comparable observations have been reported by Thomson (2012) [7] and Dye et al. (2015) [8], who identified aging as one of the most consistent predictors of tooth loss across diverse population. The predominance of complete edentulism among older adults in the present study emphasizes the importance of adopting a life-course approach to oral health prevention.

A significant association between edentulism and lower socioeconomic status was also evident. This finding supports previous research demonstrating the influence of income and educational attainment on oral health outcomes. Investigations by and Gilbert et al. (2003) [9] and Reda SF (2018) [10] reported increased tooth loss among socioeconomically disadvantaged groups, largely due to financial constraints, limited awareness, and restricted access to dental care services. These observations underscore the critical role of social determinants in shaping oral health disparities.

Behavioral determinants, particularly tobacco use, showed a strong association with edentulism in the present study. Tobacco consumption is widely recognized as a major risk factor for periodontal destruction and subsequent tooth loss. Similar findings have been reported by Tomar and Asma (2000) [12] and Bergström (2004) [11], who demonstrated a significantly higher prevalence of edentulism among tobacco users compared to non-users. This reinforces the need to integrate tobacco cessation strategies within oral health promotion and preventive programs.

In addition, irregular dental attendance and inadequate utilization of dental services were associated with increased tooth loss. Delayed care often results in the progression of preventable oral diseases to stages where extraction becomes unavoidable. Studies by Sheiham (2005) [13] and Listl et al. (2014) [14] emphasized that regular, prevention-oriented dental visits are essential for preserving natural dentition and reducing inequalities in oral health outcome. Strengthening primary oral health care systems may therefore play a pivotal role in reducing the burden of edentulism.

The findings of this study are consistent with reports from other developing regions, where edentulism continues to reflect unmet oral health needs and deficiencies in service delivery. Peres et al. (2013) [15] highlighted that sustainable improvements in population oral health require comprehensive public health policies addressing both clinical conditions and underlying social and behavioral risk factors.

Overall, the present study highlights the complex and multifactorial etiology of edentulism and underscores the importance of comprehensive public health strategies that prioritize prevention, early intervention, health education, and equitable access to dental care services.

Limitations

Despite providing valuable insights into the determinants of edentulism, the present study has certain limitations that should be acknowledged. First, the cross-sectional design restricts the ability to establish causal relationships between dentition status and the associated sociodemographic and behavioral factors. The observed associations therefore represent correlations at a single point in time.

Second, information related to tobacco consumption, oral hygiene practices, and dental visit patterns was self-reported, which may be subject to recall bias or social desirability bias. Participants might have underreported harmful habits or overreported favorable behaviors, potentially influencing the results.

Third, the study did not assess clinical variables such as periodontal status, caries experience, prosthetic rehabilitation, or systemic health conditions, which could have provided a more comprehensive understanding of factors contributing to tooth loss. Additionally, the severity and duration of tobacco use were not quantified.

Finally, as the study was conducted within a defined population, the findings may not be fully generalizable to other regions with different cultural, socioeconomic, or healthcare access profiles. Longitudinal and multicenter studies incorporating clinical and behavioral parameters are recommended to overcome these limitations.

Conclusion

The present study demonstrated a high prevalence of partial and complete edentulism among adult participants, with tooth loss showing a strong and significant association with advancing age, lower socioeconomic status, tobacco use, lower educational attainment, and irregular or absent dental visits. Older adults and individuals from socioeconomically disadvantaged backgrounds were particularly vulnerable to edentulism. Regular utilization of dental services emerged as an important protective factor for the preservation of natural dentition, highlighting the critical role of preventive and routine dental care. The findings underscore the need for targeted oral health promotion programs, tobacco cessation initiatives, and improved access to affordable dental services, especially for high-risk populations. Overall, addressing modifiable risk factors through public health interventions and strengthening preventive dental care strategies may substantially reduce the burden of edentulism and improve oral health-related quality of life in the population.

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