



# ASSOCIATION OF TOBACCO SMOKING WITH EARLY LOSS OF TEETH IN 35-44-YEAR-OLD ADULT POPULATION OF RAIPUR RANI, HARYANA INDIA.

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## ABSTRACT:

**Background:** In India, tobacco consumption has been considered a major contributor to preventable death estimated to exceed 1.5 million annually or 13% of all deaths by the year 2020 (WHO). Tobacco uses in the form of smoking is one of the injurious addictive habits which can adversely affect periodontal health eventually resulting in tooth loss.

**Aim:** To evaluate the association of tobacco with the early loss of teeth.

**Methods:** A descriptive cross-sectional epidemiological survey was conducted among 35-44 years old 120 smokers and non-smokers in Raipur Rani, Panchkula, Haryana, India. The smoking status of the study participants was based on procedures specified in WHO Basic Oral Health Survey 2013 proforma and the clinical status regarding tooth loss associated with periodontal disease was assessed. The Chi-square test, independent t-test, and Pearson's correlation was used to analyze the data. A P-Value less than 0.05 was considered statistically significant.

**Results:** The association of smoking with missing teeth was found to be statistically significant (0.005). While comparing the mean values of missing teeth among smokers and non-smokers was statistically significant (0.01) and the correlation of the number of missing teeth with frequency and duration was also found to be significant (<0.001).

**Conclusion:** Smokers were having the highest percentage of tooth loss due to periodontal disease than non-smokers. It necessities oral health education and tobacco cessation among the population.

**Keywords:** Smoking, tooth loss, oral health,

## INTRODUCTION

Tobacco use contributes to more mortality and morbidity globally than any other risk factor. Tobacco smoke disrupts the functioning of every human organ system causing most deaths through cancer, heart disease, and non-cancer respiratory diseases. Tobacco smoking mostly in the form of cigarette smoking is recognized as the most important risk factor in periodontitis<sup>1</sup>.

Cigarette smoking is a major public health problem. Various efforts such as legislative activities, public health programs and drug therapies promote cigarette cessation. Yet, despite these efforts, cigarette smoking remains a serious general and oral health problem.

Periodontal disease is one of the most common chronic diseases in adults<sup>2</sup>. It is second only to dental caries as a cause of tooth loss among adults in developed countries<sup>3</sup>. Periodontal diseases are a dynamic phenomenon with cyclical patterns of progression and resolution at any given site<sup>4</sup>.

Smoking is thought to impair the immune response and compromise the periodontal tissue's ability to heal following a period of disease activity<sup>5</sup>. Periodontal diseases are chronic infectious disorders affecting the supporting structures of dentition. Periodontal patients are often characterized by vertical or horizontal patterns of bone loss which eventually leads to early loss of teeth<sup>6</sup>.

Tooth loss remains to be a major health problem worldwide<sup>7</sup>. Cigarette smoking is a major established risk factor for periodontitis and has been linked with a higher prevalence of edentulism and fewer remaining teeth in several cross-sectional studies<sup>8</sup>, and with increased rates of tooth loss in longitudinal studies<sup>9</sup>. Smoking is associated negatively with the number of teeth such that a person with a high burden of smoking history is more likely to have fewer remaining teeth<sup>10</sup>.

The association between smoking and tooth loss was found to be very evident in various studies by Al Shammeri et al(2005)<sup>11</sup>, Dietrich et al(2007)<sup>12</sup>, Ojima M et al(2007)<sup>13</sup>, Mai X et al(2013)<sup>14</sup>, etc. A recent study by Qureshi FH et al (2018)<sup>15</sup> which was conducted to determine the factors influencing tooth loss and to assess the strength of association of these factors with tooth loss revealed an increased vulnerability of tooth loss among smokers.

Hence, there is mounting evidence that tobacco smoking has a significant adverse effect on the well-being of a person. Although there is vast documented literature on the association of smoking with tooth loss, the majority of the studies have been carried out in the westernized world, where the form and type of smoking tobacco use vary from the Indian scenario. Therefore, owing to the significant impact of smoking on tooth loss among the Indian population, the present study was conducted to assess the association between tobacco smoking and early loss of teeth in the adult population of Raipur Rani.

**MATERIALS AND METHODS:** A cross-sectional epidemiological survey was conducted among 240 participants over 2 months from January 2022 to March 2022 to find out the association of smoking with tooth loss among the adult population aged 35-44 years of Raipur Rani, Panchkula, Haryana, India. Participants above 35 years and below 44 years of age and who gave informed consent were included in the study. All the standard procedures and protocols were followed to ensure infection control during the examination procedure. The collected waste was segregated appropriately in color-coded bags and disposed of in college. A pilot study was carried out among 20 patients to check the face and content validity of the questionnaire. Before the commencement of the study, the ethical clearance was obtained from the Ethical committee of Swami Devi Dyal Hospital and dental college, Panchkula, Haryana with reference No. . The written informed consent was obtained from all the study participants after explaining the purpose of the study.

A structured pretested Performa was used for data collection, sociodemographic information assessment, the study participants' smoking status based on procedures specified in WHO Basic Oral Health Survey 2013 proforma, and the clinical status regarding tooth loss associated with tooth loss periodontal disease was assessed. The participants who had at least one tooth missing due to caries or any other condition other than periodontal disease were classified as, without tooth loss. The participants were examined by a house-to-house survey. After the survey oral health education was imparted to the participants. Tabaco smokers were educated about the deleterious effects of tobacco smoking on health and referred to the tobacco cessation cell of the college.

The data were statistically analyzed using the Statistical Package of social sciences (IBM Inc, USA) 24. Chi-square test was applied to test the association between smoking and tooth loss due to periodontal disease, an independent sample t-test was applied to compare the mean of missing teeth among smokers and non-smokers and Pearson's correlation was used to analyze the correlation of missing teeth with frequency and duration of smoking. A P-value less than 0.05 was considered statistically significant.

## RESULTS

A total of 240 participants including 120 smokers and non-smokers each in this study to find out an association between smoking and associated tooth loss due to periodontal disease among the adult population aged 35-44 years of Raipur Rani, Panchkula, Haryana, India. In the present study, a total of 69.16% of smokers and 33.33% of non-smokers were in the age group of 35-39 years whereas 30.83% of smokers and 66.66% of non-smokers were in the age group of 40-44 years (Table 1).

Among the 240 smokers, the majority used beedi (80%), 15% used cigarettes, and the rest used hookah (5%) for smoking. The majority smoked past 6-10 cigarettes per day (61.66%), 27.5% smokes 11-15 cigarettes per day, and 6.66% more than 15 cigarettes per day. More than half had a history of smoking for the past 1-10 years (68.33), 3.33% smoked for less than one year, 24.16% for the past 11-20 years, and 4.16 for more than 20 years (Table 2).

A total of 58.33% of smokers and 40.8% of non-smokers have at least one missing tooth, while the rest of the participants didn't have any missing tooth due to periodontal problems. The association of smoking with missing teeth was found to be significant ( $p$ -value=0.005), Table 3. The mean number of missing teeth among smokers and non-smokers was  $1.60 \pm 1.795$  and  $1.09 \pm 1.293$  respectively. The value of the t-test was 2.525, which was statistically significant ( $p$ -value=0.01), Table 4. The correlation coefficient of several missing teeth with the frequency of smoking was 0.463, while with duration was 0.413 and both were statistically significant ( $<0.001$ ), Table 5.

## DISCUSSION

Tobacco causes human deaths more than all deaths from HIV, illegal drug use, alcohol use and motor vehicle injuries, suicide, and murders combined<sup>16</sup>. Smokers die fourteen years earlier than nonsmokers<sup>17</sup>.

Tobacco smoking is a leading cause of human cancer and deaths which are higher in developing countries than in developed countries<sup>18</sup>. Cigarette smoking is an age-old practice in India. In India alone, nearly one in ten adolescents initiate tobacco use before ten years of age<sup>19</sup>. Tobacco smoking is causing over three million deaths every year worldwide, and if current smoking trends continue the annual mortality will exceed ten million by 2030<sup>20</sup>. Cigarette smoke contains over four thousand chemicals which include carbon mono-oxide, oxidizing radicals, nicotine, carcinogens such as nitrosamines etc.

Periodontitis and dental caries have been strongly associated with tobacco smoking. Periodontal diseases which usually increase in the middle years of life are the major reason for teeth loss in adults<sup>21</sup>. Tooth loss is amongst the most prevalent oral conditions behind dental caries and periodontal disease. Recent estimates suggest that 2.3% of the global population are edentate, which equates to around 158 million people worldwide, this prevalence increases with age. Tooth loss is the reflection of a lifetime of dental diseases and treatment and is a complex outcome to measure. Therefore it is important to understand the causes of and possible ways to prevent tooth loss in the adult population.

Epidemiological studies concerning the association between smoking and periodontal disease have increased since 1990.<sup>22</sup> It is noteworthy that the association between tobacco smokers and the occurrence of periodontal disease is strengthened by quantity and duration of consumption. Owing to this significant impact of smoking on periodontal health, the present study was aimed at evaluating the association between tobacco smoking and early loss of teeth in the adult population of Raipur Rani city.

The present cross-sectional study included a sample of 240 participants of which 120 were smokers and 120 were non-smokers. According to the age of the participants, the study revealed that 69.16% of smokers were in the age group of 35-39 years, and 66.66% of non-smokers were in the age group of 40-44 years. In a study by Gautam et al, 48% of cigarette smokers were in the age group of 35-44 years and 63% of nonsmokers were in the age group of 45-55 years.<sup>23</sup> Decreasing smoking rates among the older population reflect increased quitting activity. Tobacco cause death and illness occurring among smokers in the older age group are significant factors in declining smoking rates seen in the older population.<sup>13</sup>

Most of the smokers (80%) were using beedi, 15% were using cigarettes and only 5% were using hookah. These findings are in contrast to the study by Katuri KK et al in which 95% were using cigarettes while only 2.5% were using beedis.<sup>24</sup> This could be attributed to variations in socioeconomic status or environmental factors like availability of products in the particular area.

According to the present study, 61.66% of the smokers used to smoke 6-10 times per day, and 27.5 % used to smoke 11-15 times per day. Most of the smokers (68.33%) in the present study were having this habit for past 1-10 years.

In our study, the mean of smokers ( $1.60 \pm 1.795$ ) with missing teeth was higher when compared to that of nonsmokers ( $1.09 \pm 1.293$ ). Among 240 participants, 58.33% were smokers and 40.8% nonsmokers were having at least one missing tooth in their oral cavity. Similar findings were seen in a study by Ojima M et al in which 40.6% of smokers and 27.9% of nonsmokers had missing teeth.<sup>13</sup> Also in another study by Al-Shammari KF et al, 43.6% of smokers and 45.5% of nonsmokers had at least one missing tooth.<sup>11</sup> The most plausible explanation for the increased risk of tooth loss in smokers is the destruction of periodontal supporting tissues. A recent systematic review showed that the risk of tooth loss could be reversed after smoking cessation to the same level as that of never smokers.

The overall findings of the present study revealed that there is a statistically significant association between tobacco smoking with the early loss of teeth in the adult population of Raipur Rani city.

Strategies focusing on dental education and increased awareness regarding the prevention of smoking and highlighting its impact on oral health will reduce the prevalence of smoking in the adult population thereby reducing tooth loss. Since smoking is one of the most addicting habits, the supportive role of the dentist is imperative to improve the oral health status of the individual.

## CONCLUSION

Overall, this study has provided some evidence of an association between smoking and eventual tooth loss. This is in addition to previous evidence linking smoking to periodontal disease.

The dental team must remain conscious of discussing tobacco use and its implications for both general and dental health with their patients. Researchers in the future study should investigate reasons for tooth loss when considering smoking as a risk factor. Our findings suggest that smoking prevention and control could be important facets of comprehensive targeted strategies to control tooth loss and its complications.

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Table 1 Distribution of smokers and Non-smokers according to Age

AGE	SMOKERS		NON-SMOKERS	
	n	Percentage (%)	n	Percentage (%)
35-39 years	83	69.16%	40	33.33%
40-44 years	37	30.83%	80	66.66%
Total	120	100%	120	100%

Table 2 Distribution of smokers based on smoking habits

Smoking Habits	Number	Frequency
Type of smoking		
Cigarettes	18	15%
Beedi	96	80%
Hookah	6	5%
Frequency of smoking		
1-5 times per day	5	4.16%
6-10 times per day	74	61.66%
11-15 times per day	33	27.5%
More than 15 times per day	8	6.66%
Duration of smoking		
Less than 1 year	4	3.33
For the past 1-10 years	82	68.33
For the past 11-20 years	29	24.16
More than 20 years	5	4.16
TOTAL	120	100%

Table 3 Distribution of smokers and non-smokers according to missing teeth (Chi-square test)

Missing teeth	Smokers		Non-smokers		Chi-Square value	p-value
	n	%	n	%		
Yes	70	58.33	49	40.8	7.351	0.005*
No	50	41.66	71	59.16		
Total	120	100	120	100		

Table 4 Mean number of missing teeth among smokers and non-smokers (Independent t-test)

Missing teeth	Smokers	Non-smokers	t-value	p-value
Mean number of missing teeth	1.60±1.795	1.09±1.293	2.525	0.01*

Table 5 Correlation between frequency and duration of tobacco smoking with number of missing teeth (Pearson's correlation)

Smoking Habits	Number of missing teeth	
	Correlation coefficient	p-value
Frequency of smoking	0.463	<0.001
Duration of smoking	0.413	<0.001

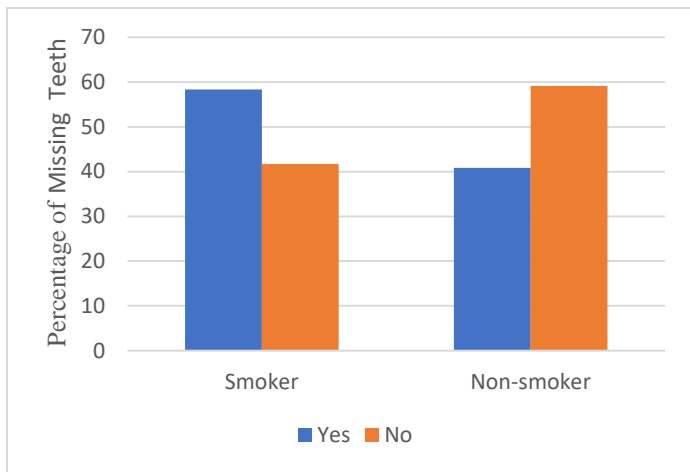


Figure:1 Missing teeth according to Smoking Habit

