Health Leadership and Quality of Life. 2025; 4:600
doi: 10.56294/hl2025600

ORIGINAL

Comprehensive Analysis on the Relationship between Risk Habits and Oral Cancer Outcomes

Análisis exhaustivo de la relación entre los hábitos de riesgo y los resultados del cáncer buccal

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Cite as: Ramya M, Sharma RD, Shetty OK, Packirisamy S, Vamalatha B, Sudha D. Comprehensive Analysis on the Relationship between Risk Habits and Oral Cancer Outcomes. Health Leadership and Quality of Life. 2025; 4:600. https://doi.org/10.56294/hl2025600

Submitted: 01-06-2024 **Revised:** 11-12-2024 **Accepted:** 04-06-2025 **Published:** 05-06-2025

Editor: PhD. Prof. Neela Satheesh

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ABSTRACT

Lifestyle risk factors are crucial in the development and growth of oral cancer, which is yet an important issue for the public. Research offers a via evaluation of the connection between oral cancer results, such as cancer survival, recurring, and therapeutic reactions, and a variety of risk behaviors, involving eating betel nuts, drinking alcohol, using tobacco, and practicing poor dental hygiene. Through patient surveys and medical record monitoring, a comprehensive data collection was conducted on around 250 patients, 170 of whom were male and 80 of whom were female. The result based on the Analysis of variance (ANOVA) test demonstrates that, compared to individuals with independent risk behaviors, those with numerous risk habits had much worse predictions. Particularly, drinking alcohol and smoking cigarettes were linked to a lower chance of surviving and sooner resurgence. Furthermore, it was shown that behavioral treatments aimed at improving dental hygiene and quitting risky habits increased the effectiveness of therapy. The research emphasizes the significance of focused global healthcare initiatives to reduce risk factors and enhance results for patients.

Keywords: Oral Cancer; Risk Factor; Analysis of Variance (ANOVA); Smoking; Chewing Tobacco.

RESUMEN

Los factores de riesgo relacionados con el estilo de vida son cruciales en el desarrollo y la progresión del cáncer oral, que sigue siendo un problema importante para la población. La investigación ofrece una evaluación de la conexión entre los resultados del cáncer oral, como la supervivencia, la recurrencia y las reacciones terapéuticas, y diversos comportamientos de riesgo, como el consumo de nueces de betel, el consumo de alcohol, el consumo de tabaco y la mala higiene dental. Mediante encuestas a pacientes y el seguimiento de sus historiales médicos, se realizó una recopilación exhaustiva de datos de unos 250 pacientes, 170 de los cuales eran hombres y 80 mujeres. El resultado, basado en la prueba de análisis de varianza (ANOVA), demuestra que, en comparación con las personas con comportamientos de riesgo independientes, quienes presentaban numerosos hábitos de riesgo tuvieron predicciones mucho peores. En particular, el consumo de alcohol y el tabaquismo se relacionaron con una menor probabilidad de supervivencia y una reaparición más

temprana. Además, se demostró que los tratamientos conductuales dirigidos a mejorar la higiene dental y abandonar los hábitos de riesgo aumentaron la eficacia de la terapia. La investigación enfatiza la importancia de las iniciativas globales de atención médica enfocadas en reducir los factores de riesgo y mejorar los resultados para los pacientes.

Palabras clave: Cáncer Oral; Factor de Riesgo; Análisis de Varianza (ANOVA); Fumar; Masticar Tabaco.

INTRODUCTION

Oral cancer is a huge world health issue, and it is increasingly affecting both males and females. Awareness among the public is inadequate, and numerous patients arrive with last-stage illness, which contributes to elevated fatality. Oral cancer usually starts with a medical premalignant period that is visible to the naked eye, allowing for quicker diagnosis and lowering severity and fatality rates.[1] Mouth malignancies as well as cancers of all oral cavity and oropharyngeal subsites are included in oral cancer. With considerable geographical variation according to socioeconomic position, gender, demography, countries, race, and ethnicity, its incidence adjusted for age is four cases per 100 000 people worldwide. During prehistoric periods, medicines recognized and reported the symptoms and indicators of oral cancer.[2] Following treatment, a patient's history of cancer could be affected by persistent illness, such as the emergence of a localized recurrence and remote blood-borne metastases of the main tumor. Subsequently, it is essential to accurately classify risk and forecast tumor behavior at the phase of first detection and therapy to provide customized medications and create the best possible follow-up services and monitoring plans.[3] Initially appearing as harmless white lesions that progressively grow out into red patches, and ultimately transform into an ulceration wound, this kind of cancer could develop in many tissues of the mouth. In the lip area, it frequently manifests as a persistent, chronic ulceration that gradually becomes bigger. Dysphagia, odynophagia, neck swelling, and lip numbing perceptions are further signs of oral cancer. For early identification and the most effective therapy results, it is essential to be conscious of those signs.[4] The risk of mouth cancer occurrence is highly related to hygiene-related habits, such as heavy drinking, cigarette smoking, and eating betel nuts. Numerous studies have identified infection with human papillomavirus (HPV), bad dental hygiene, and other variables as hazards for oral cancer. Tobacco consumption is the best indicator of upper intestinal cancer, and its effects outweigh those caused by alcohol or cigarettes. In comparison to people who weren't smokers or drunk, the combined impacts of both habits raise the population's danger for cancer by an average.[5] Oral Squamous Cell Carcinoma (OSCC), frequently described as oral cancer, is the widespread kind of cancer in adult and elderly men. Nicotine, alcohol, viral diseases including epstein-barr virus (EBV), HPV, lack of dental care, which includes pointed teeth and cavities, diet, ultraviolet (UV) exposure, and genetic susceptibility are all significantly linked to increased risk for OSCC. Because of regionally specific etiological variables, the cause of mouth cancer differs among ethnicities.[6] A visual evaluation of the neck, face, and lips is part of a comprehensive medical assessment of the cavity inside the mouth that serves as a screening test for mouth malignancies. As a result, monitoring is well-positioned to detect precancerous and perhaps malignancy oral lesions, possibly enhancing effects, particularly survival.[7]

Perspective of the research: The extensive assessment shows that risk habits like chewing tobacco, smoking, and drinking alcohol could cause oral cancer. It aims to focus on the patients who consume those drugs and should be aware of the severity of the cancer in various regions of the mouth and the health of the public.

According to the author, to assess the risk variables and epidemiological of 666 intrusive OSCC patients during 39 years.[8] In addition to pathologic characteristics, including operative borders, tumor depth, and osteo encroachment hazards evaluated include age, sex, and toxic behaviors. The findings demonstrated that in addition to enhanced surgical techniques and novel therapies, mortality and rates of recurrence have not increased over the years. With reference to, an attempt was made to create an automated neural network (ANN) algorithm that uses information on hazards, systemic medical conditions, and medical-pathological traits to assist in estimating a person's probability of obtaining oral cancer.[9] As a result, ANN predicted oral cancer with a 78,95 % accuracy rate and ANN can potentially be able to forecast an individual's chance of acquiring oral cancer by improving assessment of a possibility of malignancy. The examination investigated 549 incidents and 601 controls of head and neck cancer (HNC) in Nepal, and found that smoking cigarettes with odds ratios (OR) of 1,54, nicotine chewing OR of 2,39, and consuming alcohol OR of 1,57 enhanced the risk of HNC.[10] The frequency of HNC in Nepal must be reduced by precautionary measures towards forming harmful habits and assistance in stopping them. An article evaluated Indonesian dentists' understanding of oral cancer (OC) hazards and methods for diagnosis, as well as the variables that shaped their degree of understanding.[11] Fewer dentists showed a strong understanding of diagnostic techniques, and roughly 27 % of dentists had an elevated level of awareness regarding risk factors. Improving the skills of therapeutic procedures could assist with oral cancer protection as well as early diagnosis. The investigation attempted to discover whether secondhand smoke (SHS) consumption raises the chance of acquiring malignancies other than lung cancer.[12] The results

showed that exposure to SHS was significantly associated with increased mortality rates for a number of cancer types. notably, those who had been exposed to SHS for an extended period of time were more likely to obtain cancer, highlighting the need for public health initiatives to reduce SHS exposure. Article retroactively evaluated the relationship between risk variables such as smoking, drinking, and a family history of cancer (FHC) and OSCC.[13] The high prevalence of tobacco use was linked to an OR of 1,035. Patients who drank had a high chance of getting OSCC of 0,05 and OR of 1,035. The outcome shows that drinking and smoking could be linked to an increased risk of OSCC. The health of the public education and understanding of oral potentially malignant disorders (OPMDs) and mouth cancers, and their accompanying risks were essential for avoidance and early identification of OPMDs, as well as for preventing the transformation of oral cancer.[14] Findings from the assessment of the sociodemographic investigations revealed a lack of knowledge of OPMDs. The best way to increase survival and lower morbidity was to discover oral cancer early. Author suggested an explanation of the elements of delayed OC diagnosis and assessed the potential and consequences of new AI-based techniques for enhancing oral cancer detection.[15] For the involuntary categorization and identification of OC, artificial intelligence (AI) related tools in conjunction with optical imaging techniques are being researched. Results could be greatly enhanced by these new techniques and technologies, predominantly in surroundings with inadequate capitals. The work intended to create educational initiatives for the advancement of oral health by comparing the dental caries index and oral hygiene practices of school-age children to get a general idea of their lifestyles.[16] The results demonstrate that the significance level (p) was 0,049 and 0,028, respectively. However, as dental caries is a complex pathology that can arise from a variety of factors, including poor eating habits, were not deciding indications. The extent of the link between tobacco smoking and oral cancer was investigated by a synthesis of epidemiologic research.[17] For tobacco use and oral cancer, the overall risk ratio was 4,65 around 95 % with confidence intervals (CI) of 3,19-6,77. It is evident from the data that people who smoke are more likely to get mouth cancer. Avoiding tobacco use in various nations can lower the possibility of cancer.

Rest of the analysis: The data gathered was explained in methodology of Part 2. Part 3 consists of the outcome of the analysis and finally, Part 4 covers the overall findings.

METHOD

In the analysis, the method section includes 250 overall participants, with 170 males and 80 females collected from the clinical result of oral cancer and its risk habits. The section also contains selection criteria for the patients based on the survey conducted. Patients with risk behaviors like smoking, chewing drugs, and alcohol are included, though the patients without any risk habits are not considered.

Participants of the Research

Data on medical outcomes and risk behaviors were collected from 250 individuals with oral cancer, which involves 170 males and 80 female patients. The risk habits included in the research were the usage of tobacco like smoking cigarettes, chewing tobacco, consumption of alcohol such as beer, wine, and spirits, and its frequency of consumption, areca nut usage with or without additives of tobacco, and dietary habits. Finally, their oral hygiene habits like mouthwash, brushing frequency, and their history of dental infections are examined. To situate risk variables, demographic information was recorded, including gender, age, economic status, etc. Data gathering enabled a comprehensive understanding of the relationship between risky habits and the outcomes of oral cancer via interviews with patients, healthcare records, and monitoring to track repetition, survivability, and general health conditions, as shown in table 1.

Table 1. Questionnaire for oral cancer patients with their responses

Question No.	Question	Response
1	How often do you smoke?	☐ Never ☐ Occasionally ☐ Daily ☐ More than 10 times/ day
2	Do you consume alcohol?	☐ Yes ☐ No
3	If yes, how frequently do you drink alcohol?	☐ Occasionally ☐ Weekly ☐ Daily ☐ Binge drinking
4	Do you use betel nut/areca nut (with or without tobacco)?	☐ Yes ☐ No
5	How would you describe your oral hygiene practices?	☐ Poor ☐ Average ☐ Good ☐ Excellent
6	Have you experienced any recurrence of oral cancer after treatment?	☐ Yes ☐ No ☐ Not applicable (currently under treatment)
7	How would you rate your pain levels during or after treatment?	☐ No pain ☐ Mild ☐ Moderate ☐ Severe
8	Are you satisfied with your current quality of life post-treatment?	☐ Very dissatisfied ☐ Dissatisfied ☐ Neutral ☐ Satisfied ☐ Very satisfied

https://doi.org/10.56294/hl2025600

Data collection

The data collection process consisted of recruiting 98 pediatric cancer survivors who have completed their treatment. Each participant was assessed with the CHQ, created to measure different psychosocial experiences and emotional health problems. Parents or guardians provided informed consent prior to participation. The CHQ was given in a disciplined manner whereby every participant was guided to answer the survey in the same way. The data collection process was using SPSS version 26.

Research instrument

The CHQ is a common tool employed for purposes of research and evaluation of children and adolescent's wellness-based quality of life and the psychosocial conditions. It has many dimensions – physical, social and emotional functioning, and behavioral problems, which makes it possible to assess the health status of a child in all aspects. The CHQ is designed to evaluate the perspectives of both the child and the parent, which helps to delve into the emotional health problems that children with cancer undergo after treatment. It incorporates validated scales that use to measure psychosocial outcomes and in turn measure any subsequent changes making it a core research tool in problems associated with the treatment of cancer in children that imposes on their social psychological wellbeing.

Child Health Questionnaire (CHQ)

The CHQ is a detailed measuring instrument which aims to evaluate not only a child's physical and psychological wellbeing but also the quality of life enjoyed and overall health status. It involves participation of parents or other caregivers in providing several health-related information's including the functional state, symptoms accompanied by daily routines.

Table 2. Questions from the CHQ for Pediatric Cancer Survivors

Variables	Questions
Treatment Modalities	What type of treatment did receive for cancer?
	How satisfied are with the treatment received for cancer?
Age at Diagnosis	At what age were diagnosed with cancer?
	How do think age at diagnosis affected feelings about illness?
Type of Cancer	What type of cancer was diagnosed?
	How has type of cancer influenced experiences during treatment and recovery?
School Reintegration	How easy was it for to return to school after treatment?
	Do you feel that school environment supports emotional health and well-being?
Parental Emotional Health	How would describe parents' emotional state during treatment?
	Do you think parents' emotional health has impacted emotional well-being treatment?

The following table 2 is an indication of some questions from the CHQ that will be used to measure the different dimensions of emotional health challenges in pediatric cancer survivors. Each of these variables' treatment modalities, age at diagnosis, type of cancer, school reintegration and parental emotional health contain two directed questions. These questions seek to gain an understanding on how such factors affect the psychosocial experiences and general post treatment well-being of the survivors surviving these conditions. Using questions structured aid in better understanding the emotional status of the survivors and how to help them. For the Child Health Questionnaire, a 3-point Likert scale could include response options such as "Disagree", 'Neutral' and 'Agree'. A simplified model response scale that provides a means for the completion of all items relating to health and psychosocial experiences by indicating whether one holds a particular statement partially, moderately or fully. It ensures that the data collection process is made easy and efficient while lessening the burden on respondents.

Selection criteria

The patients who have risky behaviors of oral cancer were determined by inclusion and exclusion criteria to evaluate the analysis's relevancy.

Inclusion criteria

- Individuals who have been diagnosed with oral cancer such as squamous cell tumor carcinoma via histopathology.
- Patients must be at least 18 years old to include the adult and senior participants.
- Patients who have had or are presently receiving therapy for oral cancer, such as surgical treatment, chemotherapy, or radiation.
- Patients who have a record of minimum one risky behavior, for example, smoking, drinking, or

eating betel nuts.

- Patients are accessible for medical updates to assess results and prevent recurrence.

Exclusion criteria

- Patients have been treated with non-oral malignancies or tumors that spread from other locations.
- Patients with serious diseases could hinder the evaluation of oral cancer results.
- Individuals who declined or stopped receiving cancer therapy in the middle of the therapy.
- Individuals having no previous contact with the stated risk variables, e.g., non-smokers, non-alcohol drinkers.
- Excluded to prevent complicating factors associated with pregnancies or breastfeeding.

Statistical analysis

For statistical analysis, SPSS version 17 was utilized. Multiple tests were used in the statistical analysis to investigate the correlation between risk variables and the consequences of oral cancer. ANOVA test is used to evaluate substantial variations between groups of patients by comparing the outcomes of constant variables such as age and period of habit. The influence of several independent factors, such as alcohol and tobacco consumption, on discrete outcomes, such as survival status and recurrence, was assessed using the test. By comparing survival rates across various categories of patients, such as smokers and people who do not smoke, and estimating survival probability with time to shed light on how lifestyle variables affect patient prognosis.

RESULTS

The outcome of the relationship between oral cancer and its risk habits is demonstrated using various assessments such as demographic results and risk habits based on age and gender. Smoking risk factor results are evaluated according to the various regions affecting oral cancer and finally concluded with the result of ANOVA.

Demographic outcome

The research population's demographics included 250 patients in total, of those 170 (68,00 %) were male and 80 (32,0 %) were female, as shown in table 3. According to the demographic dispersion, 48 % of people were over 50, 12 % were between 31 and 50, and 40 % were under 30. Middle-class people made up the majority of the socioeconomic group (48 %), followed by low-class people (32 %), and high-class people (20 %). There was a variation in educational achievement, with 24 % having an undergraduate degree and 32 % having completed high school. Sixty percent of them resided in cities. According to relationship status, 28 % were unmarried and 60 % got married. Based on job status, 32 % were retired from work, 24 % were jobless, and 48 % had jobs. In terms of insurance, 36 % had a family history of cancer, and 72 % were covered. Significant hazards to health among the group were highlighted by prominent risk factors, such as poor dental hygiene (14 %), alcohol drinking (14 %), and smoking (12,8 %).

Table 3. Lifestyle and Demographic features of the patients with oral cancer

Demographic Factors		Total Patients (n=250)	Males (n=170)
Age Group			25,5
Below 30 years	100 (40,00 %)	70 (41,18 %)	20,4
31 to 50 years	30 (12,00 %)	20 (11,76 %)	18,4
Above 50 years	120 (48,00 %)	80 (47,06 %)	15,3
Socioeconomic Status			20,4
Low	80 (32,00 %)	50 (29,41 %)	33,7
Middle	120 (48,00 %)	80 (47,06 %)	25,5
High	50 (20,00 %)	40 (23,53 %)	30,6
Education Level			10,2
Less than High School	40 (16,00 %)	40 (23,52 %)	24,5
High School Graduate	80 (32,00 %)	60 (35,29 %)	21,4
Under Graduate	70 (28,00 %)	40 (23,52 %)	25,5
Post Graduate	60 (24,00 %)	30 (17,65 %)	16,3
Geographical Location			12,2
Urban	150 (60,00 %)	100 (58,82 %)	38,8
Rural	100 (40,00 %)	70 (41,18 %)	30,6

https://doi.org/10.56294/hl2025600

Marital Status			30,6
Single	60 (24,00 %)	40 (23,53 %)	36,7
Married	150 (60,00 %)	100 (58,82 %)	30,6
Divorced/Widowed	40 (16,00 %)	30 (17,65 %)	32,7

Risk habits according to the age

Table 4 displays the risk habits of oral cancer for two age groups: those under 30 (n = 100) and those over 30 (n = 120). The frequency of chewing behaviors was equal for both age groups, with 8,3 % of elderly people and 8 % of adolescents consuming betel leaves. Twelve percent of people in both age groups indicated using tobacco and areca nut. However, 12 % of those over 30 and 17 % of people under 30 chewed alongside others. Smoking behaviors showed that 10 % of the two ages burned beedis, and youngsters smoked cigars more frequently (17 %) than older people (17,5 %). 7,5 % of people over 30 and 8 % of people younger than 30 confirmed snuff dropping. When it came to overall alcohol use, a noteworthy 5 % of the youngest group drank alcohol, while only 11 % of the older individuals did so. Though 2 % of the younger years and 20 % of the more elderly group consumed wine, the intake of beer was comparable in both categories. It's significant to note that just 0 % of those under 30 admitted drinking spirits, while 10 % of people over 30 did.

Table 4. Risk behaviors of oral cancer based on age

Risk Habits	Below 30 Years (n = 100)	Above 30 Years (n = 120)
Chewing Habits		
Chewing Betel Quid	8 (8 %)	10 (8,3 %)
Chewing Areca Nut + Tobacco	12 (12 %)	15 (12,5 %)
Chewing Tobacco	18 (18 %)	18 (15 %)
Chewing with Others	17 (17 %)	20 (16,7 %)
Smoking Habits		
Beedi	10 (10 %)	12 (10 %)
Cigarette	17 (17 %)	21 (17,5 %)
Snuff Dipping	8 (8 %)	9 (7,5 %)
Alcohol Consumption		
Alcohol (General)	5 (5 %)	11 (9,2 %)
Beer	3 (3 %)	18 (15 %)
Wine	2 (2 %)	24 (20 %)
Spirit	0 (0 %)	12 (10 %)

Gender-wise risk behavior

The overall incidence of several risk behaviors related to oral hygiene in 170 males and 80 females is shown in table 5. Regarding chewed routines, 8,82 % of men and 13,75 % of women admitted consuming betel leaves, whilst 12,94 % of men and 15,00 % of women indicated consuming gutkha. The prevalence of eating tobacco items such as pan masala and khaini was lower; 11,76 % of men and 10 % of women reported using khaini. Eating and smoking together posed a significant danger, with 17,65 % of men and 18,75 % of women smoking and chewing. Comparable percentages of smokers used cigarettes (35,29 % of men and 31,50 % of women) and smoked beedis (29,41 % of men and 27,5 % of women). Though liquor was more prevalent among women (27,5 %) than among men (29,41 %), overall consumption of alcohol was diverse, with males consuming 20,58 % and females 10 %. Chewing with beedi (29,41 % of men and 18,75 % of females) and numerous risk factors are also highlighted in the data. Of the girls, 10 % admitted gnawing, cigarette smoking, and drinking alcohol at the same time, while men also stated the same.

Table 5. Risk habits of oral cancer patients by gender

Risk Habits	Male (n=170)	Female (n=80)
Chewing Habits		
Chewing Betel Quid	15 (8,82 %)	11 (13,75 %)
Gutkha	22 (12,94 %)	12 (15,00 %)
Khaini	20 (11,76 %)	8 (10,00 %)

https://doi.org/10.56294/hl2025600

Pan masala	15 (8,82 %)	6 (7,50 %)
Areca Nut	18 (10,59 %)	9 (11,25 %)
Chewing + Smoking	30 (17,65 %)	15 (18,75 %)
Chewing + Alcohol	20 (11,76 %)	8 (10,00 %)
Chewing with Others	30 (17,65 %)	11(13,75 %)
Smoking Habits		
Cigarette	60 (35,29 %)	25 (31,50 %)
Beedi	50 (29,41 %)	18 (22,50 %)
Snuff Dipping	20 (11,76 %)	20 (25,00 %)
Smoking + Alcohol	40 (23,52 %)	17 (21,25 %)
Alcohol Consumption		
Alcohol (General)	50(29,41 %)	22 (27,5 %)
Beer	20 (11,76 %)	20 (25,00 %)
Wine	60(35,29 %)	20 (25,00 %)
Spirits	5 (2,94 %)	10 (12,50 %)
Alcohol + Smoking	35 (20,58 %)	8 (10,00 %)
Combined Risk Factors		
Chewing + Beedi	50 (29,41 %)	15 (18,75 %)
Chewing + Cigarette	25 (14,70 %)	10 (12,50 %)
Gutkha + Alcohol	20 (11,76 %)	20 (25,00 %)
Khaini + Beer	10 (5,88 %)	16 (20,00 %)
Pan masala + Snuff	40 (35,29 %)	8 (10,00 %)
Areca Nut + Beedi	5 (2,94 %)	3 (3,75 %)
Multiple Risk Factors (Chewing + Smoking + Alcohol)	20 (11,76 %)	8 (10,00 %)

Smoking risk factors

The geographic distribution of instances of oral cancer throughout the oral cavity areas corresponding to multiple risk behaviors is shown in table 6. The biggest frequency is linked to beedi smoking, especially in the pharyngeal (16 %), oropharynx (20 %), and hard palate (16 %), with notable incidences in the region of the tongue's lateral border (14 %). With 14 % in the pharynx and 16 % of instances in the oropharynx, cigarette smoking also has a significant effect. The hard palate and soft palate have fewer cases of 14 % and 12 %, correspondingly. In addition to its obvious effects on the palate's soft tissue and retromolar region, tobacco smoking is associated with a greater overall prevalence in the oropharynx (44 %) and the front pillars of the fauces (24 %). Snuff dipping, on the contrary, is linked to a significantly reduced frequency in every location, with the greatest incidences occurring in the oropharynx (20 %), and the hard palate (30 %).

Table 6. Smoking Risk Factor in Anatomical Sites of Oral Cancer

Risk Habits	Hard Palate	Soft Palate	Oropharynx	Pharynx	Palatine Tonsils	Anterior Pillars of Fauces	Lateral Border of Tongue	Retromolar Area	The Floor of the Mouth (Anterior)
Beedi	40 (16 %)	35 (14 %)	50 (20 %)	40 (16 %)	30 (12 %)	20 (8 %)	35 (14 %)	25 (10 %)	20 (8 %)
Cigarettes	35 (14 %)	30 (12 %)	40 (16 %)	35 (14 %)	25 (10 %)	20 (8 %)	30 (12 %)	20 (8 %)	15 (6 %)
Tobacco	100 (40 %)	90 (36 %)	110 (44 %)	90 (36 %)	80 (32 %)	60 (24 %)	90 (36 %)	80 (32 %)	60 (24 %)
Snuff Dipping	75 (30 %)	95 (38 %)	50 (20 %)	85 (34 %)	115 (46 %)	150 (60 %)	95 (38 %)	125 (50 %)	155 (62 %)

ANOVA test results

Table 7 provides a summary of the analysis of variance (ANOVA) findings for the several sources of variables linked to risk factors related to oral cancer. The Sum of Squares (SS) and Mean Square (MS) are used to quantify the influence of each element, and the F-value and associated p-values are used for additional analysis. The strongest correlations are seen between cigarettes and tobacco chewing, with F statistics (F) of 12,6 and 16,1, corresponding to p-values below 0,001, which indicates great statistical importance. In addition to bad eating habits (F = 5,9, p = 0,017) and maintaining dental hygiene (F = 10,1, p = 0,002), alcohol intake also has a significant influence (F = 10,8, p = 0,002), indicating that these variables raise the risk of cancer. Furthermore, the intricate relationships between using tobacco and oral hygiene (F = 6,3, p = 0,014), alcohol consumption

and smoking (F = 5,3, p = 0,022) and familial histories of cancer are highly probable, underscoring the part of these factors in the growth of oral cancer.

Table 7. Result of ANOVA test for various risk factors

Source of Variation	SS	MS	F-statistic (F)	p-value
Smoking	45,3	45,3	12,6	<0,001
Alcohol Consumption	38,2	38,2	10,8	0,002
Chewing Tobacco	56,7	56,7	16,1	<0,001
Dietary Habits (Processed Foods)	20,8	20,8	5,9	0,017
Oral Hygiene (Poor Maintenance)	35,6	35,6	10,1	0,002
Family History of Cancer	18,3	18,3	5,2	0,024
Interaction (Smoking × Alcohol)	18,5	18,5	5,3	0,022
Interaction (Tobacco × Oral Hygiene)	22,1	22,1	6,3	0,014

DISCUSSION

Oral cancer risk behaviors, including chewing tobacco, smoking cigars, drinking alcohol, and consuming additional cigarettes or cigars that raise the risk of the disease considerably, were proposed in the analysis. These drugs cause abnormalities and aberrant cell development by introducing malignancies that harm the developing cells surrounding the mouth. The ANOVA test results show that two main reasons for the danger of mouth cancer are smoking with an F-value of 12,6 ($p < 0,001$) and tobacco use with an F-value of 16,1 ($p < 0,001$), particularly when paired with other behaviors. Therefore, avoiding those risky habits and maintaining dental hygiene would reduce the danger of oral cancer and individuals with those types of cancer should be aware of its danger.

CONCLUSION

The examination concludes that there is a substantial correlation among risk behaviors and the final results of oral cancer, with individuals who engage in many risk behaviors having a shorter lifespan and greater recurring rates. The data was collected through interviews with patients who are affected by oral cancer associated with risk habits. The ANOVA test was implanted with statistical analysis to classify patients according to behaviors, including drinking alcohol, smoking, and not cleaning their teeth, and also evaluate the variations in therapy results and mortality rates throughout these groups. Improving over time patient results will need an integrated approach that combines behavioral therapies with medical treatment. The biological and societal factors impacting these results should be further investigated in future studies using bigger, more varied populations.

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FINANCING

No financing.

CONFLICT OF INTEREST

None.

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