

MINI REVIEW



The dual threat of smoke: exploring active and passive smoking in oral medicine: A review

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ABSTRACT

Smoking, both active and passive, has a significant detrimental impact on oral health, particularly on the Oral mucosa. Passive smoking exposes patients to second-hand smoke, which causes distinct but related oral symptoms, as opposed to active smoking, which involves actively inhaling tobacco smoke. This review article explores the distinctions between active and passive smoking's effects on the oral mucosa and discusses the consequences for oral medicine.

KEYWORDS

Active smoking; Passive smoking; Second-hand smoke; Oral mucosa; Oral health; Tobacco-related disorders; Oral medicine

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Introduction

With over a billion people already smoking and millions more exposed to second-hand smoke, smoking continues to be a significant global public health concern [1]. Among other major health dangers, smoking both active and passive poses a considerable threat to dental health [2]. While Passive smoking, commonly referred to as second-hand smoke, exposes non-smokers to the negative effects of tobacco through the air, Active smoking is the actual intake of tobacco smoke [1].

More than 7,000 compounds, many of which are harmful and carcinogenic, are found in tobacco [3]. By decreasing blood flow to the gums, preventing healing, and raising the risk of gum disease, tooth decay, and oral cancer, these drugs jeopardize oral health. Compared to non-smokers, smokers have a far higher risk of oral cancer and are six times more likely to acquire gum disease [2]. Since, passive smoking can lead to cavities and gum irritation, it is also concerning, particularly for young people [4].

Both types of smoking are known risk factors for oral and systemic conditions, such as mucosal disorders, periodontal disease, and oral cancer [5]. Early diagnosis, prevention, and treatment of related disorders depend on an understanding of the precise impact that smoking, both active and passive, has on the oral mucosa [3].

In addition, tobacco smoking is a major contributor to halitosis, or foul breath, and chronic tooth discoloration, which frequently turns teeth yellow or brown [1]. Unexpectedly, research shows that passive smoking might have almost as detrimental an impact on dental health as active smoking, underscoring the significance of smoke-free surroundings for everyone's health [2].

Active Smoking

The deliberate inhaling of smoke from burning tobacco products, such as pipes, cigars, or cigarettes, is known as active

smoking [1]. This intentional act involves smoking, in which the smoker inhales the smoke straight into their lungs. Nicotine, tar, carbon monoxide, and thousands of other hazardous substances are among the dangerous chemicals that are directly introduced into the body by this habit [5]. Lung cancer, heart disease, respiratory disorders, and negative impacts on oral health, such as gum disease, tooth loss, and oral cancer, are all closely linked to active smoking. It is one of the main global causes of avoidable illnesses and fatalities [6].

Smoking has a devastating impact on oral health, affecting both the appearance and function of the mouth [1]. It is a major risk factor for gum disease, as it weakens the immune system and reduces blood flow to the gums, leading to inflammation, bone loss, and eventual tooth loss [3]. Smokers are significantly more prone to oral cancer due to the carcinogenic chemicals in tobacco, while tooth staining, bad breath, and delayed healing after dental procedures are common issues. Smoking also contributes to dry mouth, increasing the risk of cavities, and impairs the senses of taste and smell [4].

Additionally, conditions like smoker's melanosis, which causes dark pigmentation on the gums, further highlight the harmful effects of tobacco use on oral tissues. Quitting smoking is crucial not only to preserve oral health but also to prevent serious complications like oral cancer and tooth loss [1].

Active smoking impact on the oral mucosa [7]

Smoking actively exposes the mouth to high concentrations of carcinogens and irritants, which can result in:

- **Leukoplakia:** A common precancerous lesion on the oral mucosa, characterized by white patches, that is often associated with long-term tobacco use.
- **Smoker's melanosis:** An uptick in melanin pigmentation caused by tobacco use, typically affecting the buccal mucosa and gingiva.

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- **Nicotine stomatitis:** Heat and irritants from smoking produce white, keratotic lesions with red patches.
- **Increased risk of oral cancer:** Direct exposure to tobacco-specific nitrosamines and polycyclic aromatic hydrocarbons (PAHs) significantly increases the risk of oral squamous cell carcinoma.
- **Impaired wound healing:** Smoking delays mucosal healing by reducing blood flow and suppressing immune responses.

Passive Smoking

When non-smokers unintentionally breathe in smoke that has been exhaled by a smoker or released from the burning end of tobacco items, such as cigarettes, cigars, or pipes, this is referred to as second-hand smoke exposure or passive smoking [2]. Thousands of dangerous compounds, many of which are poisonous and carcinogenic, are present in this smoke [4]. Particularly for children, expectant mothers, and those with underlying medical issues, passive smoking can have detrimental effects on one's health. It raises the risk of lung cancer, heart disease, stroke, asthma, and respiratory infections [7].

Because it can cause ear infections, delayed lung development, and sudden infant death syndrome (SIDS), passive smoking is especially harmful to children. Chronic obstructive pulmonary disease (COPD) and the exacerbation of underlying diseases have been associated with second-hand smoking exposure in adults.

Passive smoking impact on the oral mucosa [8]

Even when passive smoking involves lower smoke concentrations, there are still significant risks to oral health:

- **Inflammation and irritation:** Second-hand smoke can irritate mucosal tissue and increase inflammatory indicators in the oral cavity.
- **Incidence of periodontal diseases:** Studies reveal that immunological modulation and systemic inflammation increase the risk of periodontal diseases in passive smokers.
- **Leukoplakia:** Long-term exposure can cause leukoplakic lesions in passive smokers; however, they are less common than in active smokers.
- **Risk of paediatric mouth conditions:** Children exposed to second-hand smoking may have delayed mouth mucosal development and increased susceptibility to infections.

Comparative analysis

The consequences of both active and passive smoking on the oral mucosa differ in intensity and presentation [9]. Active smokers have a higher risk of developing precancerous and cancerous tumors due to their direct exposure to high quantities of pollutants. Passive smokers, on the other hand, are more prone to experience inflammatory and irritation-related disorders and have a decreased but still significant chance of acquiring cancer [10].

Implications for oral physician [11]

In order to address and reverse the effects of smoking, an oral physician must combine therapeutic, supportive, and

preventive strategies that are specific to the patient's oral health requirements. Here's how to tackle this successfully:

Thorough evaluation

- **Detailed History:** Document the patient's history of smoking, including the kind, frequency, and length of time they have used tobacco.
- **Oral Examination:** Perform a comprehensive examination to determine the state of the gums, the teeth, the oral mucosa, and any indications of malignant or precancerous lesions.

Teaching and guidance

- **Quitting smoking counselling:** Inform patients about the negative consequences of smoking and offer assistance in stopping. Suggest behavioural therapy, nicotine replacement treatment (NRT), or smoking cessation programs.
- **Techniques for motivation:** Motivate patients to make healthier lifestyle choices by using motivational interviewing techniques. Emphasize the oral health benefits of quitting smoking, such as better healing, reduced risk of gum disease, and improved aesthetics.

Interventions for prevention

Oral cancer screening: routine examinations to identify malignant or precancerous tumors early. When looking for worrisome lesions, use techniques like visual inspections, toluidine blue stains, or biopsy.

- **Treatments with fluoride:** Provide topical fluoride applications to reduce the risk of decay and strengthen enamel.
- **Sealants:** In high-risk patients, consider dental sealants to prevent cavities.

Controlling periodontal disease

- **Root planning and scaling (SRP):** To get rid of the tartar and plaque that cause gum inflammation, do a thorough cleaning.
- **Antimicrobial treatment:** For severe gum infections, use chlorhexidine rinses or targeted antibiotic treatments such as doxycycline or minocycline.
- **Surgical interventions:** To replace damaged tissue and promote recovery in more advanced situations, think about periodontal surgery such bone grafting or flap surgery.

Restorative and cosmetic care

- **Teeth whitening:** To remove stains caused by tobacco use, provide expert whitening procedures.
- **Restorative procedures:** If necessary, use crowns, implants, or fillings to replace or repair damaged teeth.
- **Prosthetics:** Dentures or implants can be used to restore function and appearance in patients who have lost teeth as a result of smoking.

Encourage regeneration and healing

- **Nutritional advice:** To encourage tissue healing, suggest a

diet high in vitamins, particularly C and D, and antioxidants.

- **Salivary gland stimulation:** To treat dry mouth and increase saliva production, recommend sugar-free gum or lozenges.

Promote consistent monitoring

Make follow-up appointments to keep an eye on developments, review treatment results, and guarantee patient adherence.

Advanced Research and Treatments [12]

Laser therapy: Treat gum disease and promote tissue regeneration with lasers.

Biomaterials: Examine how damaged tissues can repair more quickly by using growth hormones, stem cells, or bioactive materials.

In conclusion, smoking has a serious negative influence on oral health, leading to gum disease, tooth loss, oral cancer, and other issues.

Conclusion

Active and passive smoking differentially affect the oral mucosa, with active smoking leading to more severe and diverse pathologies. However, the risks associated with passive smoking cannot be overlooked, particularly in vulnerable populations such as children. Comprehensive strategies combining individual care and public health interventions are essential to address these challenges and improve oral health outcomes. Reversing the negative consequences of smoking on dental health ultimately necessitates a collaboration between the patient and the healthcare professional, characterized by dedication and perseverance.

Disclosure Statement

No potential conflict of interest was reported by the author.

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