

To Determine Association between Socioeconomic Status, Tobacco Use, and Periodontal Health-A Systematic Review

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Abstract

Objective: The present systematic review with the focus question Is there an association between tobacco use in any form, socioeconomic position, and periodontal health?

Material and Methods: Literature research was conducted using online databases including Medline and PubMed, 42 articles published between 2010-2021, and were included if they matched the review criteria

Results: After screening, 23 articles were selected, from which six publications were included for the review which yielded comparable results.

Conclusion: There is a substantial evidence found between tobacco use (in any form), socioeconomic status (SES), and periodontal health. To establish total certainty, more research is required.

Key words: socioeconomic status, smoking, tobacco, periodontitis

INTRODUCTION

Periodontal diseases are among the most frequent human ailments, according to numerous epidemiological research, plaque bacteria, immunological, and genetic variables are recognised to play a pivotal role in causing periodontal disease. More attention is now being paid to the combined impact of lifestyle and psychosocial factors, along with recognized risk factors. ^[1]

Bacterial load triggers inflammatory response which leads to periodontal destruction. The true 'pathogens' in periodontitis, on the other hand, have confounded researchers. There is evidence that specific microbes are linked to the disease's progressive forms; however, the presence of these microbes in demonstrating no signs of disease progression suggests that periodontal disease progression and patient susceptibility is influenced by the environmental factors, immune response and inflammatory processes, rather than the microbiota themselves. ^[2]

Since the early 1960s, there have been reports of differences in periodontal disease prevalence and severity based on education and income. ^[3]

Annual income, education status, occupation, familial effluence, tangible property, social status, social involvement, caste, political influence, and muscular power are all factors that influence one's economic and social position, thus these factors can be defined by SES.^[4]

Smoking being one of the primary risk factors influencing the onset of periodontal disease, research indicating its effect on periodontium regardless of the type of tobacco used. Smoking is hypothesised to have an effect through decreasing neutrophil function, inducing shifts in the microbiota to become more pathogenic, and producing sustained peripheral vasoconstriction.^[5]

Cross-sectional and longitudinal evidences providesufficient proof to claim that smoking leads to periodontal apparatus breakdown indicated by clinical attachment loss and bone loss around the teeth.

Furthermore, significant social variations in the occurrence of smoking lead to socio-economic disparities in periodontitis, but the magnitude of these gradients is unexplained.^[5]

There is currently few researchavailable that illustrate the influence of smoking and socioeconomic status on periodontal disease prevalence. As a result, the current systematic review is done to investigate Is there any effect of smoking and socioeconomic status on the periodontal health?

MATERIALS AND METHODS

Focused question

Is there an association between socioeconomic status and the effects of smoking on periodontitis?

Search strategy and study selection

Online databases such as Medline andPubMed were used to conduct the literature search. Each article's references were put into consideration. From 2010 to 2021, bibliographic databases wassearched. The terms "socioeconomic status," "smoking," "tobacco" and "periodontitis" were adopted as MESH terms.

Inclusion Criteria

The following were the eligibility requirements: The literature must include information on socioeconomic status, tobacco use in any form, published data between 2010 to 2021, and subjects must be above18 years age.

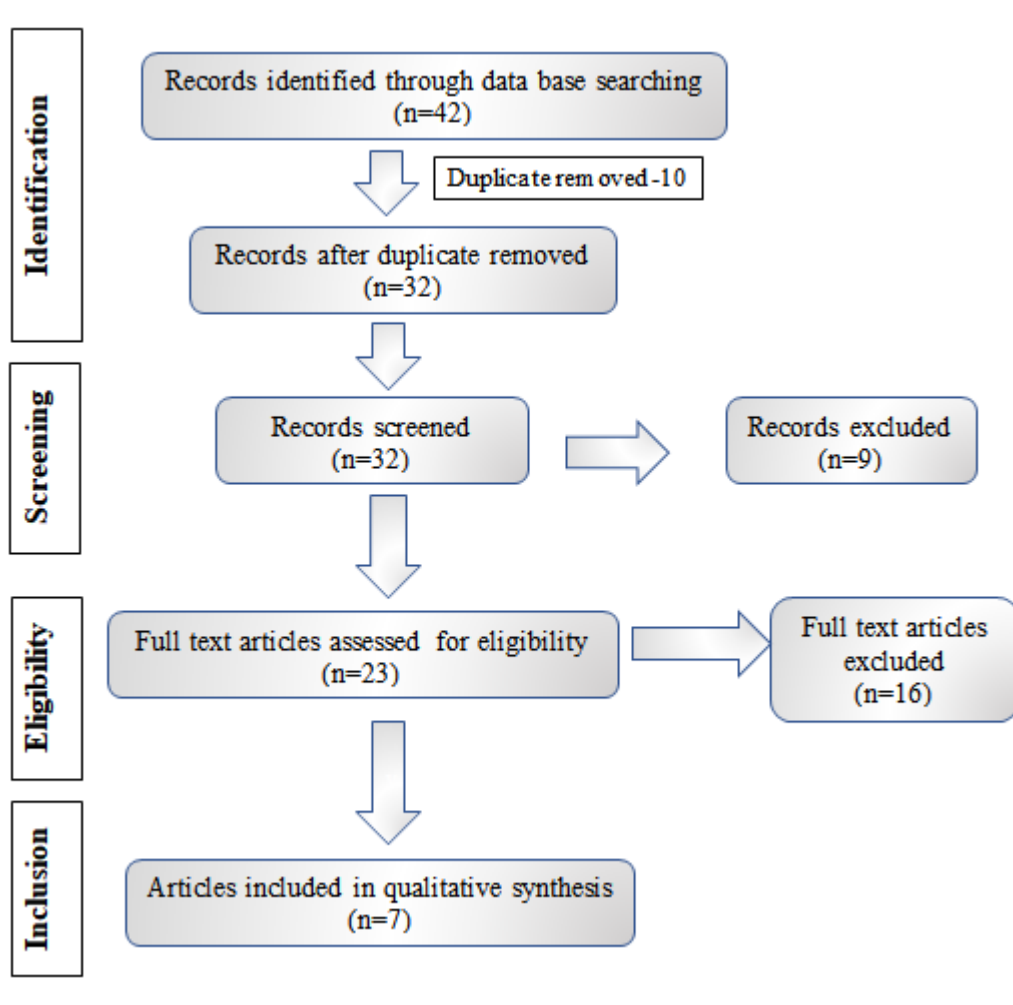
Exclusion Criteria

Studies in languages other than English, Wikipedia sources, and review articles were excluded from the study.

Author and Year	Study Design	Study Subjects	Tobacco Users	SES	Periodontal Parameter	Conclusion
Chu YH et al. 2010 ^[6]	Cross-sectional	73	Smokeless tobacco	Annual income: No answer - 2 0-25,000- 20	Plaque index (PI), Gingival Index (GI), Probing	Under deserved population at high risk of developing

				≥25,000	Depth, Attachment level,	oral and other chronic diseases. Association with high tobacco uses, low education level and limited resources for health care.
Gundala R et al. 2010 ^[1]	Cross sectional	948	Any form of tobacco	Divided into 3 classes- Lower class Middle class Upper class	Inflammation, bleeding on probing (BOP), periodontal pockets and CAL	Association between low income smoking and periodontal status.
Javed F et al. 2013 ^[7]	Cross sectional	120 (70 habitual betel quid chewers, 35 with tobacco 35 without tobacco and 50 controls)	Betel quid with tobacco	Betel quid with tobacco- 42.8-112 US \$ Betel quid without tobacco- 88.5-154.6 US \$ Control 159.5-305 US \$	PI, BOP, pocket, depth, marginal bone loss (MBL), no. of missing teeth.	Average monthly income was found to be higher in subjects consuming betel quid without tobacco in comparison with subjects consuming betel quid with tobacco. MBL, no. of missing teeth, PI, BOP and pocket depth higher who chew betel quid with tobacco.
Crysanthakopoulos N A. 2015 ^[8]	Case control	854	Smoking- 470	High >1063\$ Low ≤1063\$	CAL	Smoking, SES and CAL highly

				Monthly		corelated with periodontal disease progression
Goyal J et al. 2019 ^[9]	Cross sectional	800	Smoker (cigarette, bidi) Smokeless (khaini, gutka, betel quid with tobacco, pan masala with tobacco) (92.6% lower)	Divided into 4 classes Lower, Upper lower, Lower middle, Upper middle, Upper.	BOP, periodontal pocket, CAL	Disease prevalence high in poorest financial group. Loss of attachment seen greater in subjects taking tobacco.
Hakeem FFet al 2019 ^[10]	Cross sectional	4738	Cigarette smoker (current smoker-802 Former smoker-1809 Never smoker-2127))	Based on education: No qualification Qualification below degree Qualification with degree	Calculus deposits, gingival bleeding from gums, and pocket depth	Behaviour showed an effect modifier for the relationship between periodontal outcomes and socioeconomic status.
Goel K et al 2021 ^[11]	Cross-sectional	440	Smoking and smokeless tobacco (gutka, betel quid with tobacco, zarda)	Upper class Lower middle Lower	PI, Bleeding on probing index, OHI-S, Probing depth, CAL	Socioeconomic status, frequency of brushing tooth and subjects having smokeless tobacco showed significant association with periodontitis.



RESULT

Based on the search, a total of 42 articles were identified, of which 32 were screened after duplicates were removed. Nine items were eliminated after a title screening. Animal and laboratory research were not included in the study. The full text of the remaining publications was examined and based on inclusion criteria, and 7 papers were chosen for review, with 16 being excluded, as 10 did not match the inclusion criteria, 6 of which were review articles. The articles in the study were written in English and published between 2010 and 2021.

In this systematic review, 6 out of the 7 articles showed similar results that there is an association between smoking and SES and periodontal disease, when the three parameters (tobacco consumed in any form, socioeconomic status and periodontal health) were compared. According to Chu et al 2010^[6]; Gundala R et al 2010^[11]; Javed F et al 2013^[7]; Nikolaos A. et al 2015^[8]; Goyal J et al 2019^[9] and F Faisal et al. 2019^[10] showed results which stated there is an association between low income, tobacco consumed and periodontal status whereas only one study by Goel K et al. 2021 stated socioeconomic status and smokeless tobacco chewers did not show any significant association with periodontitis.^[11]

DISCUSSION

After reviewing 7 out of 23 full articles in detail, we found an association of tobacco consumed in any form, socioeconomic status and periodontitis. As we know, periodontitis being chronic in nature affecting tooth supporting structure leading to loss of tissue around the teeth.^[12]

Periodontitis is influenced by multiple factors, host defence systems, microbial agents, environmental, and genetic makeup.^[13]

Several risk factors have been linked to the progression and severity of periodontitis, including age, sex, socioeconomic level (Genco and Borgnakke, 2013), smoking (Calsina et al., 2002), and oral maintenance. (Zimmermann et al., 2015).^[14]

Cigarette smoking is amongst the major lifestyle risk factors for periodontitis; smoking found to have an increased loss of supporting structures of teeth than non-smoking individuals.^[12]

Several authors have previously emphasised the concept of a healthy lifestyle being closely tied to health, and they discovered that those who live an active lifestyle have mild symptoms in their teeth and gums than those who live an inactive lifestyle. As a result, the concept of lifestyle allows researchers to look at behaviour in a broader sense and provide more insight into individual's personal characteristics.^[1]

Javed F in 2013 stated a low socioeconomic position (SES), a lack of education, and ageing are all significant factors that might affect a person's lifestyle, behaviour, and oral health.^[7]

In accordance with the studies by Kadtane et al. and Gautam et al, the disease predominance was high in the poorest financial group. The reason for the decline in periodontal disease as social status increased could be due to the subjects' ability to pay for treatment methods that were found to be prohibitively expensive for those with low income.^[9]

Hass AN et al in 2019 evaluated the influence and indicators of gingival inflammation and supragingival calculus in a Brazilian adult population and discovered that the amount of calculus and gingivitis were influenced by factors such as age, self-reported proximal cleaning, smoking, dental care, and socioeconomic position.^[15]

LIMITATIONS OF THE REVIEW

The systematic review's limitation is that criteria of SES and smoking were different in all included researches, although all studies found a link between low SES, poor oral hygiene and periodontal disease development.

CONCLUSION

The findings of this systematic review provide sufficient evidence between socioeconomic status, tobacco consumption, and periodontal health. As a result, the study underlines the need by spreading awareness by increasing the numbers of oral health education programmes for educating in population with low per capita income.

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