Smokeless Tobacco and Periodontitis: A Systematic Review with Meta-Analysis

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Background

- Smokeless Tobacco (SLT) is used by over 273 million people globally and is linked to oral health problems due to prolonged mucosal exposure (Collaborators GCT, 2021) .
- While the harmful effects of smoked tobacco are well-documented, less is known about the global impact of SLT on periodontitis.
- SLT encompasses various products. Chewing or spitting tobacco consists of dried leaves with added flavorings, which are chewed or placed between the cheek and gum for nicotine absorption (American Cancer Society, 2020).
- Disparities in usage and disease burden across countries of varying income levels highlight the need for a global assessment.

Objectives

•To evaluate the global association between SLT use and periodontitis.

•To assess variations in this association based on SLT type, smoking status, and country income level.

Methods

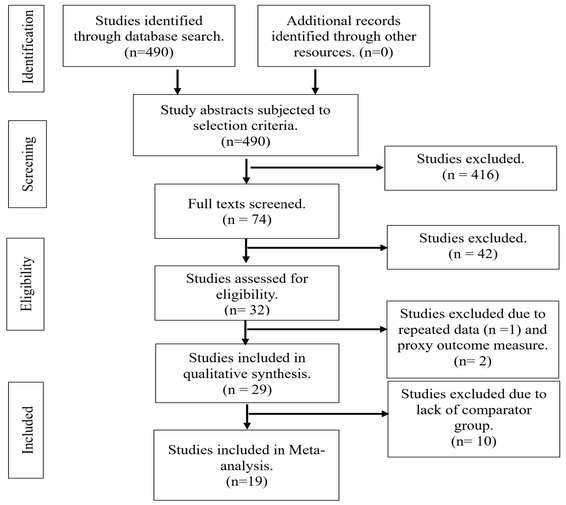
Design: Systematic review and meta-analysis following PRISMA guidelines (PROSPERO: CRD42021255179).

Search: Seven databases and gray literature searched through February 2024.

Selection Criteria: Observational/experimental studies assessing periodontitis prevalence in SLT users vs. non-users.

Risk of Bias: Each included study was also conducted independently using the 10-item risk-of-bias tool (Hoy D et.al., 2012).

Analysis: Random-effects meta-analysis with robust variance estimation. Subgroup and meta-regression analyses stratified by SLT type, smoking, country income, and study bias.



List of 19 studies included in the meta-analysis:

Figure 1: PRISMA flowchart for articles identified, screened, and included in the review.

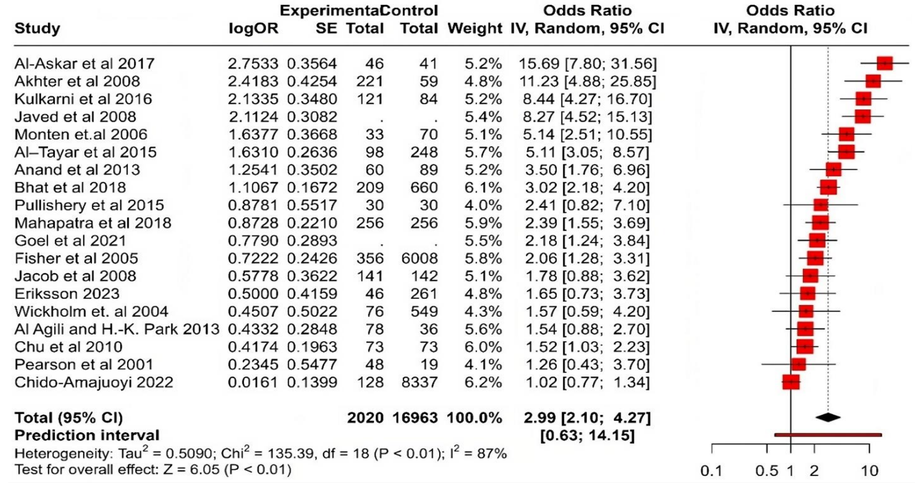


Figure 2: Random effects model for the association between smokeless tobacco use and periodontitis.

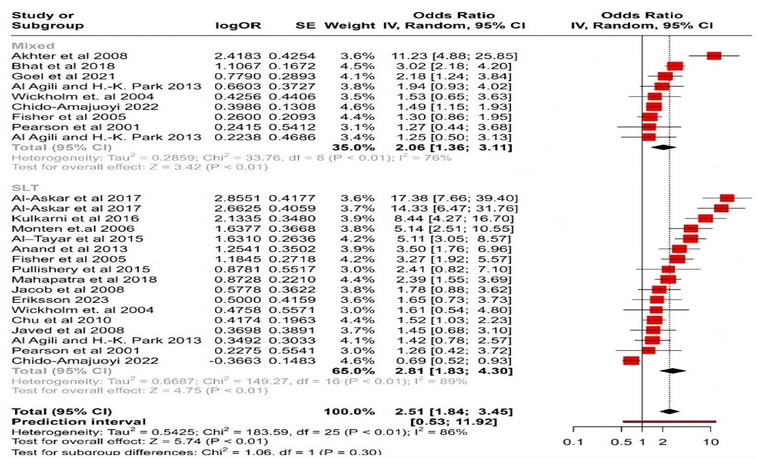


Figure 3: Association Between Smokeless Tobacco Use and Periodontitis by Smoking Status

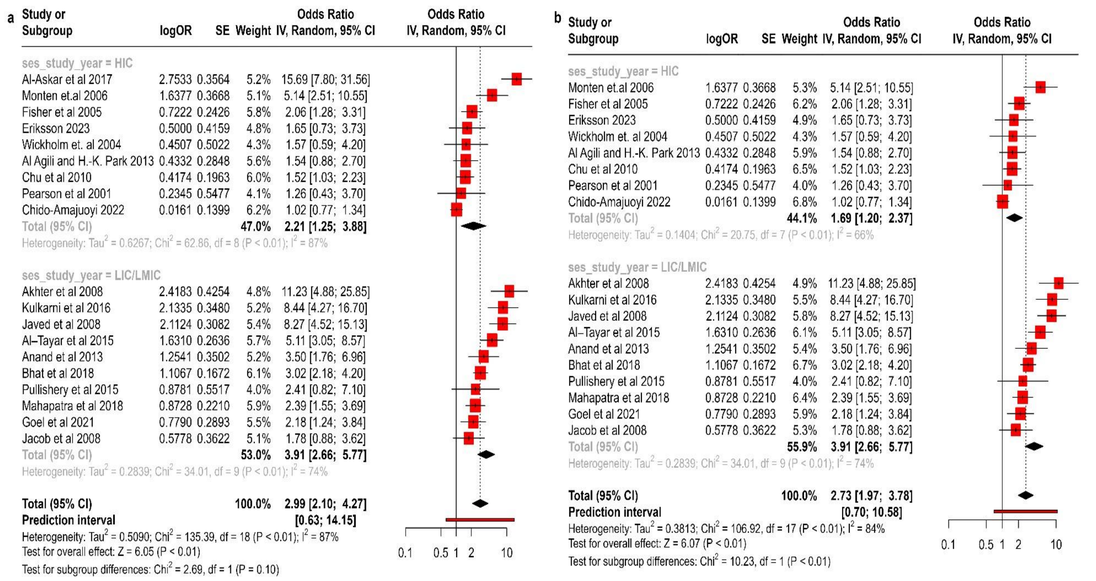


Figure 4: Association between smokeless tobacco use and periodontitis stratified by income-level of countries. Before (a) and after (b) excluding Al-Askar

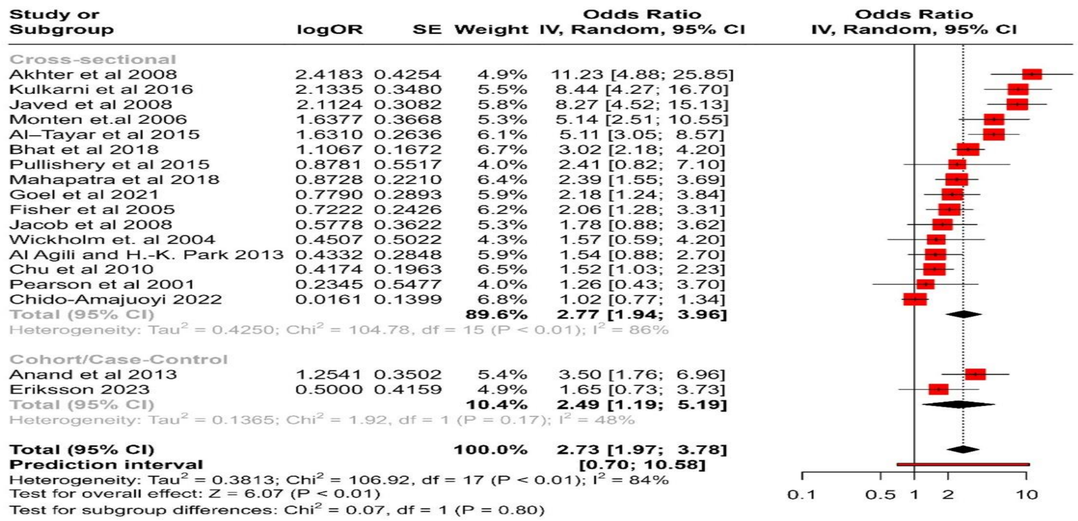


Figure 5: Association between smokeless tobacco use and periodontitis, stratified by study design.

Conclusion

1. The odds of diagnosing periodontitis were nearly three times higher among SLT users compared to non-users.
2. There was no significant difference in the effect size of SLT use on periodontitis based on concurrent smoking status.
3. SLT users from both high-income countries (HICs) and low-/middle-income countries (LICs/LMICs) had an increased likelihood of periodontitis; although effect size was higher in LICs/LMICs, subgroup differences were not statistically significant.
4. Cross-sectional studies showed SLT users were nearly three times more likely to develop periodontitis, while cohort/case–control studies reported a pooled odds ratio of 2.49 with lower heterogeneity.

References