

The prevalence of trismus among patients with oral cancer: an updated systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - No support.

Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2026100129

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 30 October 2026 and was last updated on 30 October 2026.

INTRODUCTION

Review question / Objective To update the evidence on the prevalence of trismus among patients with oral cancer and to conduct subgroup analyses based on whether the area is areca nut-endemic, in order to explore differences in the prevalence of trismus between areca nut-endemic and non-endemic areas.

Condition being studied Oral cancer (OC) is a serious global health burden with high mortality rates, especially in South and Southeast Asia. Trismus refers to the inability to open the mouth or difficulty in mouth opening; in healthy adults, a maximum interincisal distance of <35 mm is defined as trismus, which arises from abnormal states such as masticatory muscle spasm or tonic contraction. Trismus can cause multiple functional impairments, including speech impairment, difficulty eating and chewing, and dysphagia; in daily life, patients often have difficulty performing activities such as eating, drinking, laughing, and kissing. Activity limitations encompass biting/

occlusion, chewing, swallowing, and speaking, and can further lead to poor oral hygiene, pain, weight loss, and even depression. Trismus is an important complication of oral malignancy itself or its surgical and/or radiotherapeutic treatment; it can arise from direct tumor invasion of the masticatory muscles, associated nerves, and the temporomandibular joint, or occur as a complication of surgery or radiotherapy. In 2023, a systematic review and meta-analysis on the prevalence of trismus among patients with oral cancer was conducted in China (title: Meta-analysis of the prevalence of trismus in patients with oral cancer, published in Journal of Shanghai Jiao Tong University [Medical Science] in 2023). However, new observational studies on the prevalence of trismus in oral cancer have been published in recent years. According to the literature, the regions with the heaviest burden of oral cancer are concentrated in Southeast and South Asia: this region accounts for approximately one-third of global cases and one-half of global deaths, and oral cancer is the second most common cancer and the second leading cause of cancer death among men in Southeast Asia. These

high-incidence areas are precisely areas where areca nut chewing is prevalent. However, previous meta-analyses did not perform subgroup analyses according to areca nut-endemic areas. On this basis, the present study intends to pool newly published observational studies on the prevalence of trismus among patients with oral cancer and to analyze the prevalence of trismus by assessment time, tumor site, areca nut-endemic status, and tumor stage, aiming to provide evidence-based support for the prevention and treatment of trismus in oral cancer.

METHODS

Participant or population Patients with oral cancer.

Intervention None.

Comparator None.

Study designs to be included Observational studies reporting trismus in patients with oral cancer (including prospective studies, retrospective studies, and cross-sectional studies).

Eligibility criteria Studies meeting all of the following criteria will be included: (1) study type: observational studies on trismus in patients with oral cancer; (2) participants: patients with a confirmed diagnosis of oral cancer; and (3) outcome measures: the prevalence of trismus among patients with oral cancer. Studies in which trismus is caused by other factors, such as joint disorders, inflammation, or trauma, will be excluded.

Information sources Related studies in the following databases will be searched from inception to October 30, 2026: CNKI, VIP, Wanfang Data Knowledge Service Platform, China Biology Medicine disc (CBM), PubMed, EMBASE, Cochrane Library, and Web of Science from database.

Main outcome(s) Prevalence of trismus among patients with oral cancer.

Additional outcome(s) Prevalence of trismus stratified by subgroups according to assessment time, tumor site, tumor stage, and areca nut-endemic status.

Quality assessment / Risk of bias analysis Quality of included studies will be assessed using the Joanna Briggs Institute Critical Appraisal framework for prevalence studies.

Strategy of data synthesis Meta-analysis will be performed using Stata for data on the included outcomes. The choice between a random-effects and a fixed-effects model will be based on the results of heterogeneity tests, and effect estimates will be expressed as pooled prevalence with 95% CI. Heterogeneity among studies will be assessed using the χ^2 test ($\alpha = 0.05$, in combination with the I^2 value). If $P \geq 0.1$ and $I^2 \leq 50\%$, studies will be considered homogeneous, and a fixed-effects model will be used. If $P < 0.1$ and $I^2 < 50\%$, heterogeneity will be considered present but within an acceptable range, and a fixed-effects model will be used for pooling. If $P \geq 50\%$, heterogeneity will be considered present, and a random-effects model will be used. When heterogeneity is substantial, subgroup analyses will be conducted to explore the sources of heterogeneity, using assessment time, tumor site, areca nut-endemic status, and tumor stage as subgrouping factors. Sensitivity analysis will be used to evaluate the robustness of the meta-analysis results. Funnel plots, together with Egger's test and Begg's test, will be used to assess publication bias.

Subgroup analysis If considerable heterogeneity is present, subgroup analyses will be performed to investigate its sources, with different assessment times, tumor sites, areca nut endemicity, and tumor stages as grouping factors.

Sensitivity analysis To assess the robustness of the pooled estimates, we plan to perform the following sensitivity analyses by excluding individual studies one at a time (leave-one-out analysis).

Language restriction No restrictions.

Country(ies) involved China (Hainan Medical University).

Keywords oral cancer/tumors; trismus; prevalence.

Contributions of each author

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