

# INPLASY

## Efficacy of orthodontic treatment of the gummy smile: a systematic review

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### ADMINISTRATIVE INFORMATION

**Support** - Personal.

**Review Stage at time of this submission** - Data analysis.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY2023110016

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 03 November 2023 and was last updated on 03 November 2023.

### INTRODUCTION

**R**eview question / **Objective** Is orthodontic gummy smile treatment effective? P: patients with gummy smile, I: orthodontic treatment, C: no treatment, and O: gummy smile decrease.

**Rationale** Smiling is an important component of human facial expression, and improving your smile is a common reason for consultation in dental offices. Excessive exposure of the gums during smiling, known as gummy smile, can have a significant negative impact on facial aesthetic assessment and solving it is a great challenge for the orthodontist since the search for aesthetics is one of the most frequent reasons for consultation in the orthodontic consultation. Due to its multifactorial etiology, different therapeutic options arise to correct the gummy smile and the choice of any of them will depend on the etiological factor of

each case. Since smile analysis is an essential part of orthodontic diagnosis, there is a need for a tool that helps the clinician to systematically identify and record the gummy smile. This will make it possible to relate the etiological factors in a practical way and simplify the planning of orthodontic treatment.

Thus, the present review will have a theoretical importance by consolidating useful and quality information that allows unifying concepts and delimiting the field of interest in the study of the smile as a component of facial aesthetics. Likewise, the clinical importance lies in providing tools for the diagnosis and treatment plan of the problem raised, since there is no standardized information for the diagnosis and treatment plan in this anomaly; to guide the clinician to determine the etiology, severity and appropriate interdisciplinary orthodontic treatment for the case.

**Condition being studied** The gummy smile is a clinical sign associated with the diagnosis of a dentofacial anomaly, which causes a significant detriment to facial aesthetics. There is a growing need for attention to solve this unwanted characteristic, probably as a result of the rise of social networks where there is constant exposure of physical appearance to public opinion, therefore, the concern to treat it properly has acquired special prominence in clinical practice. Also, due to its multifactorial nature, it represents a challenge for the clinician to identify the etiological factor and select the orthodontic treatment plan, which is mostly interdisciplinary, where several specialists must work in coordination to obtain predictable results. The smile line can be; Normal when showing 1 or 2 mm of gum, low when showing at most three-quarters of the dental crown and high when showing 3 mm or more of gum when smiling. Likewise, gummy smile can be classified according to its etiology into; the dento-gingival which is produced by altered passive eruption, the muscular one which is produced by hypermobility of the upper lip, the dento-alveolar produced by maxillary vertical excess, and the mixed gingival smile which is a combination of two or more of the aforementioned etiological factors. Determining the etiology is essential for the choice of treatment plan. Temporary skeletal anchoring devices are highly recommended to correct gummy smile with dento-alveolar etiology mostly related to class II malocclusion. These patients are difficult to treat, and zygomatic infrazygomatic anchorage devices in combination with the straight arch technique with nickel-titanium wires are an effective alternative for improving the gummy smile. Other authors propose an interdisciplinary orthosurgical periodontal protocol that includes gingivectomy and an apically placed flap plus bone resective surgery to correct excessive gingival display in patients with altered passive eruption. From the above, it can be observed that there are different approaches to the same problem, however, the efficacy of each treatment is not detailed. Therefore, the purpose of this literature review will be to determine the efficacy of gummy smile treatment with orthodontics.

## METHODS

**Search strategy** The following databases will be searched: Pubmed, Embase, Scopus and Science Direct, using the key search terms "gummy smile" and "orthodontic", and Boolean operators (AND). It will not be considered grey literature. The Mendeley citation manager will be used to locate duplicate articles.

**Participant or population** Gummy smiling in child and adult patients will be considered.

**Intervention** Gummy smile treatment with orthodontics.

**Comparator** Gummy smile patients with orthodontic treatment and gummy smile patients without orthodontic treatment.

**Study designs to be included** Clinical studies with follow-up will be included.

**Eligibility criteria** Articles describing gummy smiling in child and adult patients will be considered. Articles that evaluate the efficacy of gummy smile treatment with orthodontics will be considered. Articles published in English and Spanish will be included. Clinical studies with follow-up will be included.

**Information sources** The following databases will be searched: Pubmed, Embase, Scopus and Science Direct, using the key search terms "gummy smile" and "orthodontic", and Boolean operators (AND). It will not be considered grey literature. The Mendeley citation manager will be used to locate duplicate articles. Articles will be selected according to titles and abstracts (RGP) according to the selection criteria. In case of doubts in the selection of an article, it will be resolved by a second author (SVM). The excluded items will be compiled in an Excel file. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta Analyse) will be used.

**Main outcome(s)** Author, country, study design, sample size, sex, age, characteristics of the gummy smile, type of malocclusion, orthodontic treatment performed, duration of treatment and efficacy result. Articles will be selected according to titles and abstracts (RGP) according to the selection criteria. In case of doubts in the selection of an article, it will be resolved by a second author (SVM).

**Quality assessment / Risk of bias analysis** Since this is a systematic review, the limitations are associated with the amount of information available, and there may be few articles that meet the required standards.

To mitigate the risk, the selection will be made through various search engines by selecting articles from indexed journals and certified databases.

Likewise, there is the limitation of not finding full text articles, for which it has been planned to have

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an assigned budget to buy the articles that are required.

Another limitation is the language, as there is no budget allocated for translations, it will only be possible to include articles in Spanish and English, which are the ones that the researchers are proficient in.

**Strategy of data synthesis** The excluded items will be compiled in an Excel file. PRISMA (Preferred Reporting Items for Systematic Reviews and Objective Analyse) will be used.

**Subgroup analysis** The two authors (RGP and SVM) will review titles and abstracts of 10 studies in order to calibrate themselves against the selection criteria. A 90% match is expected.

**Sensitivity analysis** This study will be sent to the ethics committee for exoneration, since it is a systematic review and has no ethical implications.

**Country(ies) involved** Perú.

**Keywords** “gummy smile” “orthodontic”.

**Contributions of each author**

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