

## Gummy Smile Treatment Perception by Laypersons

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### Abstract

**Background and Objectives:** A gummy smile is excessive gingival display, and it can cause harassment for many people. Gummy smile can be caused by many factors such as jaw growth problems, incorrect bite, and hyperactive or short upper lip. The aim of this study is to determine the esthetic perception of gummy smile laypersons. It shows the most appropriate patient opinions and proper treatment plans to reach the maximum patient satisfaction.

**Materials and Methods:** The current study was performed on 20 gummy smile cases photos treated by lip filler injections and orthodontic intrusion with average vertical facial patterns, divided into two groups which included 10 for each group. The sample photos contained 20 cases only to avoid layperson confusion. Cases were selected in the average age of 25-30 years. Those of missing, misaligned or extracted teeth, having visible crowns on smiling, and facial asymmetries were excluded from the study. A questionnaire for each group was sent to 50 laypersons, but 43 laypersons responded, to evaluate their satisfaction by the smile as in Figs.1-3. Laypersons didn't know which group treated either by filler injections or by orthodontic intrusion, to avoid any preferable treatment bias and to get accurate results.

**Results:** Satisfaction with filler treatment attained the highest percentage, followed by satisfaction with orthodontic treatment and satisfaction with both groups, while not being satisfied represented the lowest percentage.

**Conclusion:** Filler injections were rated the highest patient satisfaction due to the harmonically balance between soft tissues of the face after lip filling, in cases of well aligned teeth, if the teeth are maligned so orthodontic treatment came the first choice to align teeth as well as to fix gummy smile by intrusion.

**Keywords:** Gummy Smile; Gummy Smile Treatment; Gummy Smile Perception

### Introduction

Excessive gingival display, or what is known as Gummy Smile, is a condition which affords a great attention. The gingiva is a crucial aspect to be considered in the esthetics of smiling, in which the upper lip should be elevated around 80% of its normal length, exposing teeth and gingiva [1].

Sharma., *et al.* defined the normal gingival display as the gum appearance between the lower border of upper lip and gingival

margin of central incisors at smiling. During smiling, if the gingival exposure is around 0-2 mm is considered as acceptable, while more than 2 mm is considered as gummy smile. Whereas during rest state, the show of the maxillary incisor edges from 2-4 mm is considered as acceptable [2]. Facial look is important factor from facial aesthetics view, and the facial attractiveness influences the perception of the smile character. At this state, facial look should be taken into consideration in treatment plans. Also, the need to have a beauty and young look increases in culture, which allows

esthetic consideration to be more significant in treatment planning. Therefore, smile esthetics became the main aim of patients seeking orthodontic treatment [3].

Some authors agree on gummy smile treatment by orthodontic intrusion as Lahoti E., *et al.* [4] and Meriam Nasfi., *et al.* [5], while others agree with filler injections treatment which is thought to be an alternative method because it is effective and conservative and has high patient satisfaction as Ahmet Fatih Cengi., *et al.* [6] and Afnan F Al-Fouzan., *et al.* [7].

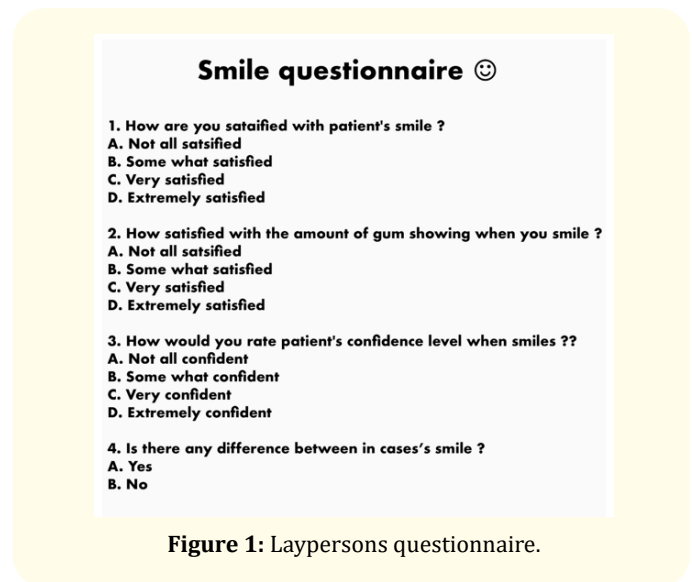
Jibin Skaria., *et al.* [8] studied the effect of botulinum toxin type-A (BTX-A) in reducing gummy smile. Twenty patients with the gingival display of >3 mm were selected through convenience sampling technique. 2.5 units of BTX-A were injected under sterile conditions on both sides of the face. The effect of the injection on gingival display was measured at the interval of 2, 4, 12, and 24 weeks. There was mean gingival exposure reduction from 4.93 to 3.705 mm at week 2. At the end of 24 weeks, the evaluation showed the mean gingival display of 4.755 mm on administration of 2.5 units on either side. They concluded that botulinum toxin was effective in eliminating gummy smile along with noticeable decrease in the nasolabial fold despite for the effect lasting only about 24 weeks.

Harry Dym and Robert Pierre [9] reviewed the etiology, diagnosis, and surgical approaches in treating the gummy smile. Gumminess display of more than 4 mm of is considered as unattractive. The cause of the gummy smile can be due to many factors and must be accurately diagnosed to get optimum treatment. Lip and crown length, hypermobile muscular lip, incisal wear, vertical maxillary excess and gingival hyperplasia could be factors that cause gummy smile. Jorge Mercado-García., *et al.* [10], examined the effect of hyaluronic acid dermal fillers. Gummy smile is classified into 3 types, which are lack of maxillary support, muscular imbalance and excessive strength of the zygomatic muscles, which causes wider smile and excessive show of buccal corridors. The result of HA filler was effective on the muscle movement and the balance between the muscle strength and the resistance of the soft tissue. The aim of this study was to determine the esthetic perception of gummy smile laypersons.

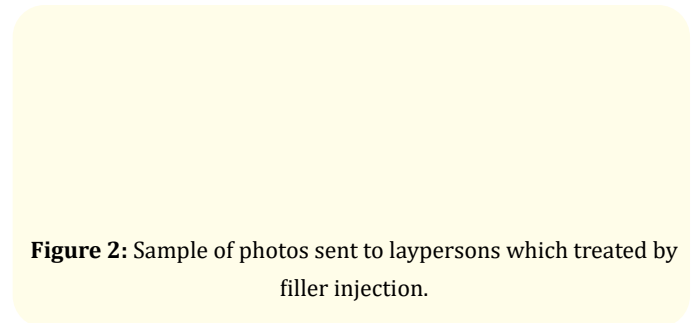
**Materials and Methods**

The current study was performed on 20 gummy smile cases photos treated by lip filler injections and orthodontic intrusion

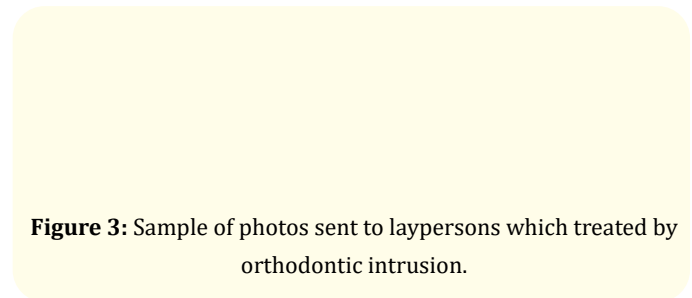
with average vertical facial patterns, divided into two groups which included 10 photos for each group. The sample photos did not exceed 20 cases to avoid laypersons confusion. Cases were selected in the average age of 25-30 years. Cases of those of missing, misaligned or extracted teeth, having visible crowns on smiling, and facial asymmetries were excluded from the study. A questionnaire [11] as shown in figure 1, was sent to 50 laypersons, but 43 laypersons who replied, to evaluate their satisfaction by the smile as in figures 2 and 3. The kind of treatment was unknown for persons to avoid any preferable treatment bias.



**Figure 1:** Laypersons questionnaire.



**Figure 2:** Sample of photos sent to laypersons which treated by filler injection.



**Figure 3:** Sample of photos sent to laypersons which treated by orthodontic intrusion.

## Results

The mean and standard deviation values were calculated for each group in each test. Data were explored for normality using Kolmogorov-Smirnov and Shapiro-Wilk tests, data showed non-parametric (not-normal) distribution. Chi square test was used to compare observed results with expected results. The significance level was set at  $P \leq 0.05$ . Statistical analysis was performed with IBM® SPSS® Statistics Version 20 for Windows

## Satisfaction

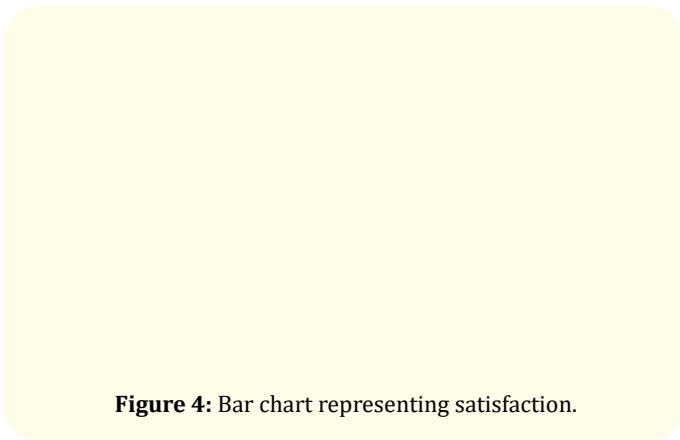
There was a statistically significant difference between (Satisfaction with filler treatment), (Satisfaction with orthodontic treatment), (Satisfaction with both) and (Not satisfied) where ( $p = 0.011$ ).

In all groups, Satisfaction with filler treatment represented the highest percentage due to facial harmonically balance after lip filling and thick lips gives more pleasant facial appearance, followed by satisfaction with orthodontic treatment because the harmony between smile and gum as laypersons said and satisfaction with both groups, while not being satisfied represented the lowest percentage as shown in table 1 and figure 4.

Variables	Satisfaction	
	n	%
Satisfaction with filler treatment	17	38.6%
Satisfaction with ortho treatment	13	29.5%
Satisfaction with both	12	27.3%
Not satisfied	2	4.5%
p-value	0.011*	

**Table 1:** The frequencies values of Satisfaction.

\*; significant ( $p < 0.05$ )



**Figure 4:** Bar chart representing satisfaction.

## Discussion

When the findings of the current study were compared to those of previous studies, it was found that the results contrasted each other. In this study, 38.6% of the gummy smiles treatment by filler were judged as very attractive, 29.5% are satisfied by orthodontic treatment and where only 4.5% as not satisfied.

The study agrees with Afnan Al Fouzan., *et al.* [7] who preferred also the injection technique due to its rapid effect, safe on patients and conservative as well as Kanhu C. Sahoo., *et al.* [12], Kethylin Broilo., *et al.* [13] and Mohamed Ali J. and Ines D' [14] who stated that this technique is minimal invasive to the patient.

The study also agrees with ZAR Mohamed [15] and M. Osama Makkiah [16], their results suggested that modified lip repositioning did not represent the degree of patient satisfaction as botox injection due to pain and tension.

The study disagrees with Walid A. Abdullah [17] who found upon results of the studies found, the surgical technique shows the best results, both from the aesthetic view and patient satisfaction perspective, in contrast to Mohamed Ali J. and Ines D' [14] finding which is the surgical management leads to a narrower vestibule and a reduced gingival display during smiling and E. Izraelewicz-Djebali and C. Chabre [18] who stated that according to the case, the type of treatment is chosen, not the surgical procedure is the best ones.

## Conclusion

- Filler injections were rated the highest patient satisfaction due to the harmonica balance between soft tissues of the face after lip filling.
- Thick lips gave more pleasant facial appearance.
- Filler injections are limited to straight forward cases with well alignment teeth.
- The orthodontic treatment came second due to residual appearance of thin line of gingiva with thin remaining thin lips, although orthodontic treatment came the first choice in cases of maligned teeth.
- Few people were not satisfied by either treatment, they expressed that the gum exposure gives more pleasant facial appearance specially in females.

### Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

### Source of Funding.

Nil.

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