

# Prevalence of Gingivitis With Intensity of Control Fixed Orthodontic Patients During The Covid-19 Pandemic in Medical Students in Surabaya

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## ABSTRACT

**Background:** Periodontal health is an important factor used to evaluate the success of orthodontic treatment. Complications that occur in periodontal treatment are reported as one of the most common side effects associated with orthodontics. **Objective:** To determine the relation between the prevalence of gingivitis and the checkup intensity of fixed orthodontic patients during the COVID-19 pandemic. The periodontal complication associated with orthodontics is gingivitis. **Methods:** This research was combining cross-sectional method and analytical observation involving students of the Faculty of Medicine Surabaya who were treated as fixed orthodontic patients in the period May-June 2022 as samples. **Results:** The data analysis used in this study was the Chi-Square statistical test. The results reveal that the relation between the control intensity and gingivitis incidence is significant in the case of fixed orthodontic patients who took regular control at the Faculty of Medicine, Universitas Wijaya Kusuma, Surabaya. The prevention of gingivitis is done by maintaining the hygiene of the dental and oral cavity. The intensity of routine check is done to provide patients with additional information on how to maintain oral hygiene and how to use the hygiene tools useful for preventing traumatic stomatitis. **Conclusion:** In the case of fixed orthodontic patients, in the era of Covid-19 pandemic, there is a significant relation between the patient's checkup intensity and the prevalence of gingivitis.

**Keywords:** Gingivitis, Intensity, Control orthodontics.

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## INTRODUCTION

The purpose of orthodontic treatment according to Graber and Swain is to get the best possible results for each individual. These goals include improvement of facial esthetics, arrangement of teeth, static occlusion relationship and good function. One of the ways to achieve this goal is the use of fixed orthodontics.<sup>1</sup>

Periodontal health is an important factor used to evaluate the success of orthodontic treatment. Complications that occur in periodontal treatment are reported as one of the most common side effects associated with orthodontics. The periodontal complication associated with orthodontics is gingivitis.<sup>2</sup>

From research conducted by Ardiansyah et al, 2019 stated that first-year students at the Faculty of Medicine and Health Sciences users of fixed orthodontic devices had status with mild criteria and plaque factors as well as excessive pressure factors due to orthodontic appliances. Fixed adhesions are the main cause of gingivitis.<sup>3</sup>

Research conducted by Shenoi, et al., 2020 regarding the effect of increasing COVID-19 cases makes patients feel anxious to make visits, especially clinics or hospitals, 19.6% of patients choose to postpone routine care visits until the COVID-19 pandemic is resolved. The study showed that patients realized the importance of routine care but patients preferred to postpone treatment due to anxiety about COVID-19.<sup>4</sup>

In the normal era, patients routinely check with an orthodontist, this can control the patient's oral hygiene status. However, as the pandemic progresses, the level of control compliance decreases and as a result, the oral hygiene status is uncontrolled and can result in the accumulation of food debris and plaque on the surface of the teeth. This resulted in the prevalence rate of gingivitis increasing compared to the prevalence rate of gingivitis in the pre-pandemic era.

From the above delineation, researchers are interested in carrying out a study on the gingivitis incidences in relation with the control intensity of fixed orthodontic patients. This study aims at examining the level of prevalence of gingivitis that can be caused if the patient is not controlled periodically during the covid-19 pandemic.

## METHODS

This research is combining cross-sectional research method and analytical observation. The samples of the study were 37 students of the Faculty of Medicine, Universitas Wijaya Kusuma, Surabaya who were under in the period May-June 2022 . This study using parameters of gingival index and uses descriptive bivariate statistical analysis to see the relationship between the dependent and independent variables using Fisher's test with a degree of significance value = 0.05.

## RESULTS

**Table 1.** Sample distribution based on gender

Gender	Quantity (person)	Percentage (%)
Female	34	90 %
Male	3	10%
Total	37	100

Source: Research Data, 2022

As shown in Table 1, the samples consist of 34 females (90%) and 3 males (10%). In Table 2, most samples are 19, 20 and 21 years old with the numbers of each age category are 9 people (25%) and the lowest age category is 15 years old which is only 1 person (2.5%).

**Table 2.** Sample distribution based on age

Age (Years Old)	Amount (person)	Percentage (%)
15	1	2,5 %
18	3	7,5 %
19	9	25 %
20	9	25 %
21	9	25 %
22	6	15 %
Total	37	100

Source: Research Data, 2022

**Table 3.** Sample distribution based on length of orthodontic treatment

Length of Orthodontic Treatment	Quantity (person)	Percentage (%)
≤ 2 years	11	35 %
> 1 year	26	65 %
Total	37	100

Source: Research Data, 2022

In Table 3, 65% of the samples (26 samples) have been under orthodontic treatment for more than 1 year but less than 2 years. The rest (35%) has been under the treatment for more than 2 years.

**Table 4.** Sample distribution based on control intensity

Control Intensity	Amount (person)	Percentage (%)
Seldom	3	7,5 %
Often	28	77,5 %
Always	6	15 %
Total	37	100

Source: Research Data, 2022

Table 4 shows the description of respondents based on length of use, Seldom >4-6 weeks, Often ≤ 5 weeks, Always ≤ 4 weeks, that the majority of samples (77.5%) are through the routine checkup during their treatment. It confirms Kawabata & Danta's opinion that the patients always go to their routine control.

**Table 5.** Gingival Index Score Table

Category	Indication	Scor
Normal	No inflammation	0
Mild	Slight change in color and texture, no bleeding when performed.	1
Moderate	Redness, edema, bleeding when performed	2
Severe	Redness, edema, ulceration and spontaneous bleeding	3

Source: Research Data, 2022

Based on table 5, the category scores of gingivitis index are 0 for normal gingiva; 0,1 - 1 for Mild inflammation; 1,1 - 2 for Moderate inflammation; and 2,1 - 3 for Severe inflammation.

**Table 6.** The correlation between prevalence of gingivitis and control intensity of fixed orthodontic patients during the covid-19 pandemic

Control intensity	Gingiva index			Amount		P
	mild	Moderate	Severe	F	%	
Seldom	1 14,3 %	2 28,6	4 57,1 %	7	18,9%	0.03
Often	15 62,5 %	8 33,3%	1 4,2 %	24	64,9 %	
Always	3 50%	2 33,3	1 16,7 %	6	16,2 %	
Amount	19 51,4 %	1 32,4	6 16,2 %	37	100 %	

Based on table 6, shows that there is a relation between the prevalence of gingivitis and the control intensity, as corroborated by a significance level of <0.05.

## DISCUSSIONS

The majority of samples in the study were women (36 samples). Women tend to do orthodontic treatment more often on aesthetic grounds. Women tend to Table 6. Relationship of Prevalence gingivitis based on intensity of control their teeth as they age. Most women do not have enough self confidence when they do not maintain their oral hygiene.<sup>5</sup>



In this study, the longest duration of using of fixed orthodontic devices was > 1 year. These results show that on average, students of the Faculty of Medicine, Universitas Wijaya Kusuma, Surabaya have used fixed orthodontic devices for a long period of time. Most of the samples in this study had a constant control intensity (1-2 months) during the COVID-19 pandemic, namely 31 respondents (82.5%). These results are not in line with research conducted by Bustati et al (2020), which revealed that there was a tendency that patients with orthodontic treatments prefer to delay their visits during the COVID-19 pandemic as they were worried to get infected. However, the research conducted by Martina et al (2021) was in line with the stipulation of the new normal provisions and the vaccination program so that the anxiety to carry out routine controls in patients with orthodontic treatment was reduced.<sup>6,7</sup>

Gingival health status in patients undergoing orthodontic treatment is not only influenced by dental and oral hygiene, but can also be influenced by orthodontic appliance pressure, gender, age, duration of use and regularity of control over users of fixed orthodontic appliances.<sup>5</sup> Orthodontic control is performed to check the movement of patients' teeth, examine the fixed orthodontic devices, inspect the orthodontic improvement, and solve some patients; complaints during the treatment. In general, orthodontic checkup is able to maintain gingival health in fixed orthodontic patients.<sup>8</sup> Gingivitis is an inflammation that involves the soft tissue around the teeth, namely the tooth tissue.<sup>9</sup> Gingivitis is a mild form of periodontal disease with clinical signs in the form of red, swollen and easy-to-bleed gingiva without any evidence of alveolar bone damage.<sup>10</sup>

In this study, it was found that there was a relation between the gingivitis incidence and the control intensity ( $P > 0.05$ ). The result confirms the research conducted by Diah et al (2019) which presented that users of fixed orthodontic appliances with healthy gingival

criteria were more commonly found in respondents who carried out checkup according to the specified schedule. The intensity of routine checkup allows dentists to fix orthodontic devices that are not in their proper place to avoid gingivitis. The incidence of gingivitis can also be worsened by poor oral hygiene. The routine checkup intensity, however, does not guarantee a person has good oral hygiene. It is to motivate and inform fixed orthodontic users about how to maintain oral hygiene. In every visit, the dentist inform them tips on how to perform proper oral and dental hygiene and how to use oral hygiene tools that may help them prevent gingivitis.<sup>5,11</sup>

## CONCLUSION

A significant relation between control intensity and gingivitis prevalence during the COVID-19 pandemic is proven in this research. Prevention of gingivitis in orthodontic users is done by maintaining the hygiene of the dental and oral cavities. The routine checkup enables patients to meet their dentists regularly. This routine meetings allow the dentists to provide additional information about how to preserve oral hygiene by using appropriate oral hygiene tools of which ultimate goal is to help them prevent gingivitis.

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