# THE RELATIONSHIP BETWEEN THE PERCEPTION OF FIXED ORTHODONTIC APPLIANCE USAGE AND INTEREST IN MALOCCLUSION TREATMENT AMONG STUDENTS

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**ABSTRACT**

Orthodontic care needs are increasing and also vary; in addition to the demand need for maintenance, there are socioeconomic factors and the availability of maintenance services. Perceptions regarding the use of simplified orthodontic devices from aesthetic aspects are generally the primary motivation of patients to carry out malocclusion treatment. In orthodontic treatment, perception can be seen from the aesthetic and functional aspects. Orthodontic comes from the word ortho, which in Greek means normal, straight, or correct, while dontos means teeth. Background Orthodontic care is the need to improve the health of the oral cavity, oral cavity function, and personal appearance. The success of orthodontic care not only depends on the ability and technique used but is influenced by the interest and motivation factors of the patient himself/herself. Most individuals who carry out orthodontic care are usually driven by personal care related to appearance and aesthetics. Most malocclusion has an effect on a person's self-image. Therefore, orthodontic treatments must be able to improve the individual aesthetic. The research objective is to find out the correlation between the perception of the use of simplified orthodontic devices and the interest in Malocclusion Care for FKG students of the Universitas Muslim Indonesia. This research was descriptive quantitative research using cross-sectional data. The statistical test used was the Chi-Square test. The sample in this study consisted of 121 samples. Data analysis was tested using a chi-square test with a degree of meaning $\alpha = 0.05$. The statistical analysis results show that the value of P 0.419 then HA is unaccepted, which means there is no correlation between the perception of the use of Orthodontic device and interest in the treatment of malocclusion. There is no correlation between the perception of using the Orthodontic Device and Malocclusion Care in FKG students of the Universitas Muslim Indonesia.

**ABSTRAK**

Sebagian besar individu melakukan perawatan ortodontik biasanya didorong oleh kepedulian pribadi yang berkaitan dengan penampilan dan estetik. Kebanyakan maloklusi tersebut akan mempunyai efek terhadap *self image* seseorang, oleh karena itu perawatan ortodontik harus dapat memperbaiki estetik invididu. Kebutuhan perawatan ortodontik makin meningkat dan juga bervariasi, selain bergantung pada perlunya perawatan, terdapat faktor sosio-ekonomi dan ketersediaan pelayanan perawatan. Persepsi mengenai penggunaan alat ortodontik cekat dari aspek estetik umumnya merupakan motivasi utama dari pasien untuk melakukan perawatan maloklusi. Pada perawatan ortodontik cekat, persepsi dapat dilihat dari aspek estetik dan aspek fungsional. Keberhasilan perawatan ortodontik tidak hanya bergantung pada kemampuan dan teknik yang digunakan melainkan dipengaruhi oleh faktor minat dan motivasi dari pasien sendiri. Tujuan penelitian adalah untuk mengetahui bagaimana hubungan persepsi penggunaan alat ortodontik cekat dan minat perawatan maloklusi pada mahasiswa FKG Universitas Muslim Indonesia. Penelitian ini merupakan penelitian kuantitatif deskriptif dengan menggunakan desain *cross sectional*. Uji statistik yang digunakan adalah uji *Chi-Square*. Adapun sampel pada penelitian ini terdiri dari 121 sampel. Analisis data diuji dengan menggunakan chi-square test dengan derajat kemaknaan $\alpha = 0,05$. Hasil analisis statistik menunjukan bahwa nilai *P* 0,419 maka Ha ditolak yang berarti tidak terdapat hubungan antara antara persepsi penggunaan alat ortodontik cekat dengan minat terhadap perawatan maloklusi. Tidak terdapat hubungan antara persepsi penggunaan alat ortodontik cekat dan minat perawatan maloklusi pada Mahasiswa FKG Universitas Muslim Indonesia.

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## INTRODUCTION

Orthodontic treatment comes from the Greek word "ortho," meaning normal, straight, or correct, and "dontos," meaning teeth. The background of orthodontic treatment includes improving oral health, oral function, and personal appearance. One of the main reasons individuals seek orthodontic treatment is to enhance the appearance of their teeth and face, as malocclusion can impact a person's self-image. Therefore, orthodontic treatment aims to improve individual aesthetics (Proffit et al., 2011).

In practice, orthodontic appliances are divided into two types: removable and fixed appliances. Removable appliances are simpler and can be inserted and removed by the patient, while fixed appliances are installed by a dentist and cannot be removed by the patient. Fixed appliances consist of several active components, such as arches, wires, brackets, and tubes (Houston, 2011). The impact of fixed orthodontic appliances and clear aligners on periodontal conditions indicates that while clear aligners tend to result in better periodontal conditions, fixed appliances remain effective in addressing malocclusion and maintaining tooth position stability post-treatment (Di Spirito et al., 2023). However, some studies also suggest that orthodontic treatment with aligners yields poorer outcomes compared to fixed appliances in adult patients (Papageorgiou et al., 2020).

The growing interest in orthodontic treatment is also influenced by the increasing prevalence of malocclusion worldwide, ranging from 11% to 93%, encompassing mild to severe malocclusion. The most common reason for seeking orthodontic treatment is to improve facial and dental appearance (Foster, 2011).

A previous study by Jolanda et al. (2018) on high school students at SMAK "X" Bandung revealed no significant relationship between perceptions of fixed orthodontic appliance use and interest in malocclusion treatment among students (Jolanda et al., 2018). This study aligns with research that will be conducted on students at the Faculty of Dentistry, Universitas Muslim Indonesia, considering factors such as age, education, and field of study in examining perceptions and interest in the use of fixed orthodontic appliances. Therefore, this study is titled "The Relationship Between the Perception of Fixed Orthodontic Appliance Use and the Interest in Malocclusion Treatment Among Students of the Faculty of Dentistry, Universitas Muslim Indonesia."

## METHOD
### Type of Research
This study is descriptive quantitative research using a cross-sectional design aimed at identifying the correlation between the perception of fixed orthodontic appliance use and the interest in malocclusion treatment among students of the Faculty of Dentistry, Universitas Muslim Indonesia.

### Place and Time of Research
This study was conducted in July 2022 at the Faculty of Dentistry, Universitas Muslim Indonesia, Makassar City.

### Population and Sample
The population in this study consisted of all preclinical (undergraduate) students of the Faculty of Dentistry, Universitas Muslim Indonesia, who were not undergoing fixed orthodontic treatment, totaling 173 students from the 2019, 2020, and 2021 cohorts. The sample included preclinical students of the Faculty of Dentistry, Universitas Muslim Indonesia, who met the criteria set by the researchers. The sampling criteria were as follows: Inclusion criteria: Preclinical students of the Faculty of Dentistry,

Universitas Muslim Indonesia, who were not using fixed orthodontic appliances and had no history of fixed orthodontic treatment. Exclusion criteria: Subjects who failed to complete either of the two questionnaires provided. The minimum required sample size was estimated using the Slovin formula, resulting in 121 samples.

## Data Collection

This study utilized a Likert-scale questionnaire to assess perceptions regarding fixed orthodontic appliances. The questionnaire evaluated individual attitudes through four aspects: awareness, interest in learning, desire to explore further, and willingness to undergo treatment. It also gauged interest in orthodontic treatment (aesthetic and functional) among individuals with malocclusion. The questionnaire was distributed via Google Forms. The study employed questionnaires that had undergone validity and reliability testing. The tests were conducted on 30 respondents, resulting in an R-table value with a 5% significance level of 0.374. Further calculation yielded an R-calculated value from Cronbach's alpha of 0.939. The questionnaire items were deemed valid since the R-calculated value was more significant than the R-table value.

## Data Analysis and Processing

The analysis used in this study was univariate, which analyzed each research variable descriptively by calculating the frequency distribution of the research variables and subjects based on age, gender, duration of fixed orthodontic appliance use, perception of fixed orthodontic appliance use, and interest in malocclusion treatment. The univariate analysis employed frequency analysis. The bivariate analysis in this study examined relationships. Correlation analysis explained the relationship between two variables, specifically the relationship between the perception of fixed orthodontic appliance use and interest in malocclusion treatment among students of the Faculty of Dentistry, Universitas Muslim Indonesia. The statistical analysis technique was the Chi-Square test with a significance level (p-value) < 0.05. Chi-square was used because the data were in nominal categorical form.

## RESULT

A study, "The Relationship Between the Perception of Fixed Orthodontic Appliance Use and the Interest in Malocclusion Treatment Among Students of the Faculty of Dentistry, Universitas Muslim Indonesia, " has been conducted. It has involved 121 respondents.

**Table 1. Frequency Distribution of Respondents by Age at the Faculty of Dentistry, Universitas Muslim Indonesia, in 2022**

| Age | N | % |
|-----|---|---|
| 18 | 19 | 15,7% |
| 19 | 28 | 23,1% |
| 20 | 41 | 33,9% |
| 21 | 28 | 23,1% |
| 22 | 5 | 4,1% |
| **Total** | **121** | **100%** |

Based on Table 1, it can be seen that the respondents' ages range from 18 to 22 years, with the highest number of respondents being 20 years old (33.9%).

**Table 2. Frequency Distribution of Respondents by Gender at the Faculty of Dentistry, Universitas Muslim Indonesia, in 2022**

| Gender | N | % |
|--------|---|---|
| Male | 22 | 18,2% |
| Female | 99 | 81,8% |
| **Total** | **121** | **100%** |

Based on the frequency distribution results in Table 2, it is known that the frequency for females (81.2%) is higher compared to males (18.2%).

**Table 3. Frequency of Perception of Fixed Orthodontic Appliance Use and Interest in Malocclusion Treatment at the Faculty of Dentistry, Universitas Muslim Indonesia, in 2022**

|  | N | % |
|---|---|---|
| Moderate | 74 | **61,2%** |
| High | 47 | **38,8%** |
| **Total** | **121** | **100%** |

Based on the frequency distribution results in Table 3, it is observed that the frequency of moderate perception is 74 people (61.2%), and high perception is 47 people (38.8%).

**Table 4. Frequency Distribution of Interest in Malocclusion Treatment at the Faculty of Dentistry, Universitas Muslim Indonesia, in 2022**

|  | N | % |
|---|---|---|
| Moderate | 92 | 76% |
| High | 29 | 24% |
| **Total** | 121 | 100% |

Based on the frequency distribution results in Table 4, it is observed that the frequency of moderate interest is 74 people (61.2%), and high interest is 47 people (38.8%).

**Table 5. Frequency Distribution of Perception of Fixed Orthodontic Appliance Use and Interest in Malocclusion Treatment**

| Perception of Fixed Orthodontic Appliance Use | Interest in Malocclusion Treatment | | | P |
|---|---|---|---|---|
|  | Moderate | High | Total |  |
|  | 56 (75,7%) | 18 (24,3%) | 74 (100%) | 0,419 |
|  | 36 (76,6%) | 11 (23,4%) | 47 (100%) |  |
| **Total** | 92 | 29 | 121 |  |

Based on the frequency distribution results in Table 5, 75.7% of the respondents fall into the moderate interest category with an aesthetic perception. In comparison, 24.3% of the respondents fall into the high-interest category with an aesthetic perception. Regarding functional perception, 76.6% of the respondents fall into the moderate interest category, and 23.4% fall into the high-interest category.

## DISCUSSION

The results of this study show that the respondents are between 18 and 22 years old (Table 1), which, according to Monks, is classified as the late adolescent stage, a period of consolidation toward adulthood. Psychologically, malocclusion that affects the aesthetic appearance of the face can impact the emotional condition of adolescents in this age range, potentially leading to emotional disturbances. Some adolescents tend to feel insecure about their appearance or the limited speaking function caused by malocclusion (Tasya et al., 2023). Factors such as age, aesthetic perception, and communication with the doctor influence patient compliance in using fixed orthodontic appliances, which is crucial for achieving optimal results in malocclusion treatment. Intrinsic motivation is often a major driving force in college students and young adults (Di Spirito et al., 2023). Aesthetic concerns are the primary motivation for orthodontic treatment; there is a temporary decline in quality of life during the early phase of treatment; factors such as gender and ethnicity do not influence patient perceptions of treatment; and

a positive relationship between orthodontist–patient–parents is important for achieving compliance and patient satisfaction (Yassir et al., 2020).

A study on 121 Faculty of Dentistry, Universitas Muslim Indonesia students found no correlation between the perception of using fixed orthodontic appliances and the interest in malocclusion treatment (Table 5). The chi-square test results with a p-value of 0.419 indicate that the alternative hypothesis (Ha) is rejected, meaning there is no significant relationship between the perception of using fixed orthodontic appliances and the interest in malocclusion treatment among students of FKG UMI. Similar research by Jolanda et al. (2018) on SMAK "X" Bandung students also found no correlation between the perception of using fixed orthodontic appliances and the interest in malocclusion treatment (Jolanda et al., 2018).

In contrast, other studies have found a relationship between the need for orthodontic treatment and interest in treatment with fixed orthodontic appliances among students at FKG-UMI (Novawaty et al., 2024). Research has shown a positive correlation between the perception of using fixed orthodontic appliances and interest in treatment among high school students, with 75% having very good aesthetic perception and 33% showing very high interest in treatment (Sari et al., 2016). Other studies show that aesthetic perceptions of smiles among students who are undergoing or have not undergone orthodontic treatment are mostly rated as good or very good (Hadi et al., 2022). The majority of high school students in Denpasar City have realistic expectations and a good understanding of fixed orthodontic treatment (Anggaraeni et al., 2023). A relationship between adolescent knowledge of malocclusion and the interest in using fixed orthodontic appliances was also found in SMA Negeri 7 Balikpapan (p = 0.02) (Usman et al., 2024).

The previous research by Jolanda et al. (2018) on SMA "X" Bandung students found that education/knowledge level can influence perceptions and interest in orthodontic treatment. This aligns with research by Dewi et al. (2016) titled "Differences in Orthodontic Treatment Knowledge Between Rural and Urban Junior High School Students in Yogyakarta." Knowledge of orthodontic treatment, influenced by education level, can affect perceptions and interest in orthodontic treatment. Dewi et al. (2016) stated that there is a difference in orthodontic treatment knowledge between rural and urban junior high school students (Dewi et al., 2016).

These differing results are also consistent with Robbin's theory (in Fatah Hanurawan, 2010), which states that an individual's social perception is influenced by situational factors, the recipient, and the target object. The level of understanding of dental health, including factors such as education, gender, and socioeconomic status, influences perceptions related to orthodontic treatment. This study also indicates that females are more interested in fixed orthodontic treatment, in line with Motloba's (2016) findings, which suggest that females are more interested in orthodontic treatment than males, as facial appearance is their main priority (Hanurawan, 2010).

Educational background may be a factor contributing to differences in knowledge about orthodontic treatment. Knowledge about an object can influence an individual's behavior toward that object (Notoatmodjo, 2007). The research shows that there is a difference in perceptions regarding dental aesthetics between students in non-dental and dental programs. This suggests that individuals with a dental background may have a more critical tendency regarding malocclusion and dental health knowledge.

This study also shows that females are more interested in fixed orthodontic treatment, aligning with findings that indicate females are more interested in orthodontic treatment than males, prioritizing facial appearance. Motivation and attitudes toward seeking orthodontic treatment also have a significant impact on quality of life, including side effects related to orthodontic treatment, particularly for various fixed orthodontic appliances (Muttaqin et al., 2021). However, the quality of life for male students undergoing fixed orthodontic treatment is higher than for females, particularly in the dimension of psychological dysfunction (p<0.05), but no significant differences were found (Fauziyah Algerie et al., 2022).

Furthermore, awareness of the importance of oral health and the impact of malocclusion can motivate individuals to seek orthodontic treatment. The results of this study show that 89% of first-year female students using fixed orthodontic appliances had gingivitis with mild gingivitis criteria (Ardiansyah & Prajarini, 2019).

## CONCLUSION AND SUGGESTION

Based on the results of the research and studies conducted, the conclusion that can be drawn is that there is no correlation or relationship between the perception of using fixed orthodontic appliances and the interest in malocclusion treatment among students of the Faculty of Dentistry, Universitas Muslim Indonesia.

As for recommendations, it is suggested that respondents with moderate interest be encouraged to increase their knowledge or information regarding the benefits of using fixed orthodontic appliances for individuals with malocclusion issues, both from an aesthetic and functional perspective.

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