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Research Article

Characteristics of Orthodontic Appliance Users based on Demographics, Self-Perception, Psychosocial, and Oral Disorders (Study Among Undergraduate Students in West Jakarta)

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ABSTRACT

Introduction: Awareness of malocclusion and the importance of orthodontic treatment continue to increase, in order to improve dentofacial appearance, psychosocial factors, and quality of life. Orthodontic treatment can be done using conventional fixed appliances, or removable appliances called clear aligners, that has an upsurge in demand recently. Previous studies have evaluated the advantages and disadvantages of orthodontic treatment types, yet there are still lack of findings regarding the characteristic of user. **Objective:** This study aims to describe the characteristics of orthodontic appliances users based on demographics, self-perception, psychosocial, and oral disorders, among undergraduate student in West Jakarta. **Methods:** This cross-sectional study was conducted in October until December 2022. The study population covered 7 universities located in West Jakarta. Sample consist of 201 undergraduate students taken by purposive sampling. Self-administered questionnaire, that had been validated was used to obtain sociodemographic data and factors that can affect the preference of orthodontic appliances. **Results:** The most common orthodontic appliances used is fixed orthodontic appliances (79.6%) that was installed by orthodontists (58.8%). Most students using orthodontic appliances were female (76.2%), aged 17-25 years (99.4%), and currently undergoing study in non-medical faculty (71.9%). Students were highly aware of their dental arrangement (90.5%). They thought that their facial and dental aesthetics (97.5%) and social interaction (66.2%) will improve after orthodontics treatment, though they were not sure about getting better career opportunities (51.7%). **Conclusion:** Fixed orthodontic appliances still become the main preference among undergraduate university students in West Jakarta. Awareness and dissatisfaction of their dental arrangements were substantial as well as the desire that facial and dental appearance will improved after treatment. Orthodontic treatment was considered as way to enhance social interaction social attractiveness.

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INTRODUCTION

In Indonesia, the national prevalence of dental and oral health problems has increased from 25.9% in 2013 to 57.6% in 2018. One of the most common problems was malocclusion.¹ Malocclusion is a form of malalignment of teeth or jaw relationships that affects individual oral health and aesthetic appearance. Malocclusion causes periodontal disease, mastication disorders, speech disorders, temporomandibular disorders, as well as increasing the prevalence of dental caries.^{2,3} Malocclusion can be treated using orthodontics appliances, that should be carried out by an orthodontist in order to provide the correct treatment procedure and not causing harm.^{4,5}

Nowadays, orthodontic treatment can be done using conventional fixed appliances or removable appliances called clear aligners, that has an upsurge in demand among society recently.⁶ Fixed orthodontic appliances consist of bands and brackets cemented to the teeth with archwire, elastics and springs as active components to move the teeth and can only be removed and installed by a dentist.⁷ Clear aligners are made of transparent thermoplastic, that can be removed and installed by the patient. It provides an aesthetic treatment with more comfortable experience, proven by increased in the number and complexity of cases treated.⁸

Awareness of malocclusion and the importance of orthodontic treatment continue to increase, in order to improve dentofacial appearance, psychosocial factors and quality of life.⁴ Adolescents notice the value of physical attractiveness in the social environment, leading them to a strong desire to use orthodontic appliances.⁹ However, high awareness is not always associated with action, Marques et al. found that though 78% adolescents desired orthodontic treatment, only 69% of the parents had the ability to provide the treatment due to economic factor.¹⁰

Several published studies showed that many factors affect the decision to obtain orthodontic treatments. A study found that 80% of orthodontic patients were only concerned about their dental aesthetics appearance other than any functional aspects.¹¹ Socioeconomic factors had the most significant impact due to the high costs of examinations, procedures and treatment itself.¹² Socioeconomic factors as well as occupation status, income level, or educational level, were known as part of social determinants of health, that may improve the standard of living and the equality of health.¹³ Financial situation has become one of the limitation in orthodontic treatment, notably that orthodontic treatment mostly not covered by health insurance.¹⁴

Although previous studies have evaluated the

advantages and disadvantages of orthodontic treatment types, there are still lack of findings regarding the characteristic of user. The combination of esthetics, amenities, and efficacy may come into consideration towards treatment choices. This study aimed to describe the characteristics of orthodontic appliances users based on demographics, self-perception, psychosocial, and oral disorders, among undergraduate student in West Jakarta.

MATERIALS AND METHODS

This cross-sectional study was conducted in October until December 2022. The study population covered 7 universities located in West Jakarta. The study sample consist of 201 undergraduate students undergoing either fixed orthodontic appliances or clear aligners, taken by purposive sampling. Participants agreed to the informed consent were requested to fill the validated questionnaire by completing the Google Forms (Google LLC, Mountain View, CA) sent through social media. Sociodemographic data consist of age, gender, study major, parents' educational level and socioeconomic status. Factors affecting the preference of orthodontic appliances consist of participants self-perception, psychosocial, and oral disorders aspects. This study was approved by the Ethics Commission of the Faculty of Dentistry Trisakti University No. 589/S1/KEPK/FKG/8/2022.

Statistical Analysis

The validity and reliability of the questionnaire had been tested on 43 respondents prior to data retrieval. Validity was assessed by using Pearson correlation coefficient ($p < 0.05$). Reliability was confirmed with Cronbach's alpha coefficient.¹⁵ Data were analyzed using Statistical Program for Social Science (SPSS) 2017 version 25 (IBM, Armonk, NY) and Microsoft Office Excel 2019 version 16.62 (Redmond, WA) software. The distribution among categorical variables was represented in frequency tables.

RESULTS

Distribution of participant's demographic characteristic was presented in Table 1. Majority of the students were female (73.1%), aged 17-25 years (99.5%), and undergoing study in non-medical faculty (73.6%). Based on parental educational level, 68.7% of the fathers and 65.7% of the mothers had completed at least diploma degree or higher. Based on parental occupation, 91.5% of the fathers and 48.8% of the mothers were working in non-medical field, with monthly income higher than IDR 3,500,000 (87.6% and 42.8% respectively).

Table 2 shows that based on participant's self-

Table 1. Characteristic of Undergraduate Students in West Jakarta

Variable	Frequency	Percentage (%)
Gender		
Male	54	26.9
Female	147	73.1
Age		
12-16	1	0.5
17-25	200	99.5
University		
Bina Nusantara	31	15.4
Trisakti	49	24.4
Esa Unggul	38	18.9
Tarumanegara	49	24.4
Raffles	9	4.5
Ukrida	20	10.0
Mercu Buana	5	2.5
Faculty		
Medical	53	26.4
Non-Medical	148	73.6
Father's last education		
Low	5	2.5
Intermediate	58	28.9
High	138	68.7
Mother's last education		
Low	3	1.5
Intermediate	66	32.8
High	132	65.7
Father's occupation		
Medical	17	8.5
Non-Medical	184	91.5
Mother's occupation		
Medical	29	14.4
Non-Medical	98	48.8
Not working	74	36.8
Father's monthly income		
< IDR 3,500,000	25	12.4
> IDR 3,500,000	176	87.6
Mother's monthly income		
< IDR 3,500,000	43	21.4
> IDR 3,500,000	86	42.8
No Income	72	35.8
Installation of orthodontic appliances		
General Dentist	68	33.8
Orthodontist	133	66.2
The first person to notice poor dental arrangement		
Father	10	5.0
Mother	61	30.3
Self	79	39.3
Friend	1	0.5
Dentist	50	24.9

Variable	Frequency	Percentage (%)
The first person who suggest doing orthodontic treatment		
Self	40	19.9
Dentist	98	48.8
Friend	6	3.0
Parents	52	25.9
Other wearing appliance	5	2.5

Table 2. Self-perception aspect of undergraduate students in West Jakarta

Questions	Yes (%)	No (%)
Do you realize having a poor dental arrangement?	182 (90.5)	19 (9.5)
Are you satisfied with your dental arrangement?	44 (21.9)	157 (78.1)
Do you think your dental and facial will improve after orthodontic treatment?	196 (97.5)	5 (2.5)
Do you think your self-confidence will improve after orthodontic treatment?	167 (83.1)	34 (16.9)

Table 3. Psychosocial aspects of undergraduate students in West Jakarta

Questions	Yes (%)	No (%)
Are you sure you will get good career opportunities after doing the orthodontic treatment?	97 (48.3)	104 (51.7)
Do you expect good social interaction after doing the orthodontic treatment?	133 (66.2)	68 (33.8)
Do you think poor dental alignment is related to decreased social attractiveness?	158 (78.6)	43 (21.4)

perception, most of students realized that they are having poor dental arrangement (90.5%), as well as 78.1% felt unsatisfied with their dental arrangement. Majority of students look forward that their dental and facial appearance will improve after undergoing orthodontic treatment (97.5%), as well as their level of self-confidence (83.1%).

Based on psychosocial aspects in Table 3, over half of the students (51.7%) were not sure that they would get

good career opportunities after undergoing orthodontic treatment. However, as much as 66.2% wish for an enhancement in good social interaction, while 78.6% thought that poor dental alignment is related to decreased social attractiveness.

Based on oral function disorders in Table 4, over half of the students had no problem while speaking (73.1%) and sense no pain at the temporomandibular joint (56.7%). Most of students consider that their dental health will improve after the treatment (99%), as well as their biting and chewing (81.6%).

Table 5 shows that the most common orthodontic appliances used is fixed orthodontic appliances (79.6%). Most of students using fixed orthodontic appliances were female (76.2%), aged 17-25 years (99.4%), and undergoing study in non-medical faculty (71.9%). Most of students using fixed orthodontic appliances had father with at least diploma or higher degree (69.4%), worked in non-medical field (92.5%), and having monthly income higher than IDR 3,500,000 (85.6%). Most of students using fixed orthodontic appliances had mother with at least diploma or higher degree (66.2%), worked in non-medical field (50%), and having monthly income higher than IDR 3,500,000 (40%). Most fixed orthodontic appliances installed by orthodontists (58.8%). Most of students using clear aligners were female (61.0%), aged 17-25 years old (100%), and undergoing study in non-medical faculty (80.5%). Most of students using clear aligners had father with at least diploma or higher degree (65.9%), worked in non-medical field (87.8%) and having monthly income higher than IDR 3,500,000 (95.1%). Students using clear aligners had mother with at least diploma or higher degree (63.4%), worked in non-medical field (43.9%) and having monthly income higher than IDR 3,500,000 (53.7%). Most clear aligners installed by orthodontists (95.1%).

Table 4. Oral disorders aspects of undergraduate students in West Jakarta

Questions	Yes (%)	No (%)
Do you have any problem while speaking?	54 (26.9)	147 (73.1)
Do you have any pain/clicking sound around your ears (at the temporomandibular joint)?	87 (43.3)	114 (56.7)
Do you think your dental health will improve after orthodontic treatment?	199 (99.0)	2 (1.0)
Do you think your biting and chewing will improve after orthodontic treatment?	164 (81.6)	37 (18.4)

Table 5. Characteristic of undergraduate students in West Jakarta based on the type of orthodontic appliance used

Variable	Fixed orthodontic appliance	Clear aligners n (%)
	n (%)	
Gender		
Male	38 (23.8)	16 (39.0)
Female	122 (76.2)	25 (61.0)
Age		
12-16	1 (0.6)	0 (0.0)
17-25	159 (99.4)	41 (100.0)
Faculty		
Medical	45 (28.1)	8 (19.5)
Non-Medical	115 (71.9)	33 (80.5)
Father's last education		
Low	5 (3.1)	0 (0.0)
Intermediate	44 (27.5)	14 (34.1)
High	111 (69.4)	27 (65.9)
Mother's last education		
Low	3 (1.9)	0 (0.0)
Intermediate	51 (31.9)	15 (36.6)
High	106 (66.2)	26 (63.4)
Father's occupation		
Medical	12 (7.5)	5 (12.2)
Non-Medical	148 (92.5)	36 (87.8)
Mother's occupation		
Medical	20 (12.5)	9 (22.0)
Non-Medical	80 (50.0)	18 (43.9)
Not working	60 (37.5)	14 (34.1)
Father's monthly income		
< IDR 3,500,000	23 (14.4)	2 (4.9)
> IDR 3,500,000	137 (85.6)	39 (95.1)
Mother's monthly income		
< IDR 3,500,000	38 (23.7)	5 (12.2)
> IDR 3,500,000	64 (40.0)	22 (53.7)
No Income	58 (36.3)	14 (34.1)
Installation of orthodontic appliances		
General Dentist	66 (41.2)	2 (4.9)
Orthodontist	94 (58.8)	39 (95.1)

DISCUSSION

Based on self-perception, most of the students felt that they had poor dental arrangement, unsatisfied with their dental arrangement, and expecting their appearance will be improved along with their level of self-confidence after undergoing orthodontic treatment. Most orthodontic patients are mainly motivated to improve dental aesthetics since facial appearance may represent an individual image as well as increasing self-confidence.^{11,16}

Social environment is essential for adolescents regarding to their self-image and solid identity.¹⁷ Adolescents pay great attention to physical attractiveness in order to be accepted and appreciated in the social environment, therefore dental aesthetics considered able to strengthen their psychosocial status.^{8,18} A study based on psychosocial factors showed poor dental arrangement is associated with a decrease in social attractiveness. Better social interaction is very much expected after doing the orthodontic treatment.

Although they wish for an enhancement in good social interaction, majority of students were not sure about getting better career opportunities after undergoing orthodontic treatment. Individual with an aesthetics smile is considered more confident, especially in social and work environment. Apart from the aesthetic factors that can be beneficial in terms of career opportunities, many other factors may be involved, such as individual competence and motivation to work.^{19,20} Opportunity to advance career are known to be related to with organization planning and career development, including facilitated training and support from human resources management.¹⁹

Majority of students felt that they had no issue regarding ability to speech, painful sense nor clicking sound at the temporomandibular joint, yet they expected that their chewing function and dental health will improve after treatment. Knowledge and awareness regarding dental and oral health may encourage interest in orthodontic treatment. Although majority of students had non-medical educational background, they were aware of the value for improving themselves aesthetically, functionally and socially.²¹

Number of fixed orthodontic appliances user were higher than clear aligners among undergraduate students in West Jakarta. This result is reasonable considering that fixed orthodontic appliances were known and used long before clear aligners.^{6,22} Clear aligners are also commonly used for malocclusion cases with a low level of complexity, thereby limiting its use.⁶ Although clear aligners has become a profitable alternative to conventional fixed orthodontic appliances, it is important to acknowledge tooth movements that may pose treatment challenges and recognize those cases which may be more successfully treated using fixed orthodontic appliances.²³ Most of clear aligners treatment was performed by orthodontist, in consequence of the competence and technology needed, such as three-dimensional treatment planning, CAD-CAM computer technology, stereolithography, and tooth movement simulation software.⁶

Demographic data of undergraduate student show the same characteristics distribution among fixed appliances and clear aligners user. Dissatisfaction of dental profile was not affected by gender or age in particular.²⁴ Many previous studies found that higher level of parental education and social economic class were related to increased number of orthodontic treatments, but there was no explanation about the treatment type.¹⁴

CONCLUSION

Fixed orthodontic appliances still become the main preference among undergraduate students in West Jakarta. Awareness and dissatisfaction of their dental arrangements were substantial as well as the desire that facial and dental appearance will improved after treatment. Orthodontic treatment was considered as way to enhance social interaction social attractiveness. Understanding the elements involved in the demand for orthodontic treatment in a certain population will bring through a better assessment of treatment needs and priorities.

CONFLICT OF INTEREST

The authors declare that there are no conflict of interest regarding the publication of this paper.

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