DENTINO
JURNAL KEDOKTERAN GIGI
Vol V. No 1. Maret 2020

CORRELATION BETWEEN ORTHODONTIC TREATMENT NEEDS AND PSYCHOSOCIAL CONDITION OF ADOLESCENTS IN SMPN 1 MARABAHAN

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ABSTRACT
Background: *Malocclusion creates problems in mastication, swallowing, speech, high risk of trauma, periodontal disease, caries and decreased aesthetic which can affect psychosocial. People with malocclusion often receive poor response from others, such as insult or inappropriate nickname. The psychological effects on people with malocclusion include inferiority, embarrassment, difficulty in adaptation, emotional disorder, lack of confidence, uncomfortable social interaction, unhappy, and often compare themselves with others. These will affect a person's development, especially during adolescence.* ***Objective:*** *The purpose of this research was to know about correlation between the orthodontic treatment needs with the psychosocial condition in adolescent at SMPN 1 Marabahan.* ***Methods:*** *This research was an observational analytic using cross sectional approach. The sample size using Slovin in this research was 76 students of SMPN 1 Marabahan. Data collection was performed using IOTN-DHC and PIDAQ questionnaire. Data analysis consisted of univariate analysis which described each variable and bivariate analysis with Spearman test.* ***Results:*** *The orthodontic treatment needs at SMPN 1 Marabahan based on the highest IOTN-DHC was in the category of really need the treatment. They were about 40 people (53%). The psychological condition in adolescent based on the highest PIDAQ was on the student with an average score of 45.22.* ***Conclusion:*** *There is a significant correlation between orthodontic treatment needs with the psychosocial condition of adolescent.*

Keywords: *Adolescent, IOTN-DHC, Orthodontic treatment needs, Psychosocial, PIDAQ*

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INTRODUCTION

Malocclusion is a condition of abnormal relationship between teeth or jaws. Malocclusion is also considered as a discrepancy between teeth on the maxilla and mandible.[1] Malocclusion creates problems in mastication, swallowing, speech, high risk of trauma, periodontal disease, and caries and decreased aesthetic which can affect psychosocial.[2] The prevalence of malocclusion, according to Riskesdas in South Kalimantan, on 12-14 years age group is 15.6%, the highest compared to other age groups. Barito Kuala is a regency in South Kalimantan with the highest oral problem, which comprises of 48.6%.[3] According to a study conducted in SMPN 1 Marabahan, Barito Kuala on 1 December 2018 with 10 students as samples, 7 of them had malocclusion. Therefore, further research is needed regarding malocclusion in the school.

The development of orthodontics in dentistry leads to willingness to improve irregular tooth position. One of the reasons that people seek orthodontic treatment is aesthetic need that aims to improve the appearance and psychosocial of an individual.[4] The aesthetic affects a person's perception in social relationship and psychological health. People with malocclusion often receive poor response from others, such as insult or inappropriate nickname. The psychological effects on people with malocclusion include inferiority, embarrassment, difficulty in adaptation,

emotional disorder, lack of confidence, uncomfortable social interaction, unhappy, and often compare themselves with others.[5] This will affect a person's development, especially during adolescence. Adolescence is a change of phase from childhood to adulthood. During this phase, they will experience physical and psychosocial changes, thus facial appearance and tooth aesthetic are important factors for self-appearance and self-assessment.[6]

There are various measurement methods in determining orthodontic treatment needs in a population. One of which is the Index of Orthodontic Treatment Need (IOTN). This index is accepted internationally because it is considered valid, easy to use, and can be trusted.[7] IOTN has two components, which are Aesthetic Component (AC) and Dental Health Component (DHC).[2,8] There is a difference between IOTN-DHC and IOTN-AC, in which AC only assess subjectively by viewing photographic scale, such as 6 anterior teeth or only based on appearance, while DHC assess objectively using measurement and assessment of occlusal condition that may affect teeth health, such as missing teeth, overjet, crossbites, displacement, and overbites.[9]

Psychosocial Impact of Dental Aesthetic Questionnaire (PIDAQ) is a psychometric measurement tool that can assess psychosocial and aesthetic impact regarding oral health.[10,11] This questionnaire comprises of 32 items, divided into 6 items on dental self-confidence, 8 items on social aspects, 6 items on psychological aspect from tooth aesthetic, and 3 items from facial aesthetic.[12]

According to the statement above, the author is interested to conduct a research to determine the correlation between orthodontic treatment needs and psychosocial condition of adolescent. Orthodontic treatment need is assessed according to Index of Orthodontic Treatment Need – Dental Health Component (IOTN-DHC), while psychosocial condition is assessed according to Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) in SMPN 1 Marabahan.

MATERIALS AND METHODS

This research received ethic permission by the Research Ethics Committee, Faculty of Dentistry, Lambung Mangkurat University No. 086/KEPKG-FKGULM/EC/XII/2018. This research was an observational analytic using cross-sectional approach, which data collected from one period. The population of this research was all students of SMPN 1 Marabahan. The number of students in SMPN 1 Marabahan was 310 students. The sample size was determined using *Slovin* formula, which was used to obtain small sized sample but representative to the whole population. *Slovin* formula found sample size of 76 people. The sampling technique used in this research was purposive sampling and according to inclusion and exclusion criteria. The inclusion criteria included 12-14 years old students, mixed or permanent dentition, not currently receiving orthodontic treatment, and good general health condition. The exclusion criteria included inability to participate and students with dentures. The instruments used in this research were tooth impression tray, rubber bowl, alginate spatula, dental stone spatula, face masks, gloves, dental apron, caliper, iron ruler, Dental Health Component assessment sheet, and PIDAQ questionnaire sheet. The materials used in this research were normal setting alginate, type 3 dental stone, paper towels, and water.

The author came to the location to choose sample according to predetermined inclusion and exclusion criteria. The author gave explanation to the participants regarding the procedure and asked for permission in the form of informed consent. Participants were instructed to fill PIDAQ questionnaire. Impression preparation was conducted by instructing the participants to wear dental apron and fit appropriate impression tray. The author then made maxillary and mandible impression using alginate. The resulting impressions were poured with type 3 dental stone. The hardened stone then measured with caliper and iron ruler and adapted to Dental Health Component (DHC). The data obtained from PIDAQ questionnaire and IOTN-DHC then processed and analyzed.

Data collection was performed using IOTN-DHC and PIDAQ questionnaire. Univariate data analysis was performed to describe the characteristics of each variables, which was independent variable (orthodontic treatment needs) and dependent variable (adolescence psychosocial condition). Each data was presented descriptively according to the needs and gender. Bivariate data analysis was performed to determine the correlation between independent variable and dependent variable. Data were analyzed using *Spearman* correlation test.

RESULTS

Based on IOTN-DHC assessment, the orthodontic treatment needs of SMPN 1 Marabahan students were shown on the table below:

Table 1. Frequency distribution of orthodontic treatment needs based on IOTN-DHC.

Orthodontic Treatment Needs	Frequency (n)	Percentage (%)
No/Little Need	17	22%
Moderate Need	19	25%
Great Need	40	53%
Total	**76**	**100%**

According to Table 1, the "great need" category had the highest frequency, which was 40 students (53%), compared to other categories.

Table 2. Frequency distribution of IOTN-DHC according to gender.

Orthodontic Treatment Needs	Gender	
	Male	Female
No/Little Need	10	7
Moderate Need	4	15
Great Need	16	24
Total	**30**	**46**

Based on Table 1, the students who really need treatment were comprised of 16 males and 24 females. The category had more frequency than "no/little need" and "moderate need" categories.

According to PIDAQ assessment, psychosocial conditions of SMPN 1 Marabahan students were shown on the table:

Table 3. Frequency distribution of psychosocial conditions of SMPN 1 Marabahan students based on PIDAQ.

Orthodontic Treatment Need	Frequency (n)	PIDAQ Score (mean)
No/Little Need	17	26,52
Moderate Need	19	30,89
Great Need	40	45,22

According to Table 3, the highest PIDAQ score mean was found in "great need" category with 45.22 points. The higher the orthodontic treatment needs, the higher the psychosocial condition.

Table 4. Frequency distribution of psychosocial condition based on gender.

Gender	Frequency (n)	PIDAQ Score (mean)
Male	30	34,20
Female	46	39,59

According to Table 4, female students had mean PIDAQ score of 39.59, higher than male students, who had 34.20.

Below is the bivariate data analysis using *Spearman* correlation test:

Table 5. Bivariate data analysis using *Spearman* correlation test

Data Analysis	*Spearman* Test	
	Significance	Coeff. Correlation
PIDAQ with IOTN-DHC	0,0001*	0,636
PIDAQ with IOTN-DHC in male	0,003*	0,527
PIDAQ with IOTN-DHC in female	0,0001*	0,694

*p < 0,05

In *Spearman* correlation, if the significance value (sig or p) is less than 0.05, then the correlation is significant. Otherwise, if the significance value is more than 0.05, than there is no significant correlation. Based on Table 5, it is found that the significance value of PIDAQ and IOTN-DHC was 0.0001 with correlation coefficient of 0.636 (strong correlation). In male students, the significance value was 0.003 with correlation coefficient of 0.527 (moderate correlation) and in female students, the significance value was 0.0001 with correlation coefficient of 0.694 (strong correlation). All three values were less than 0.05, which means that there was a significant correlation between orthodontic treatment needs and psychosocial condition of adolescents, thus the hypothesis was accepted.

DISCUSSION

According to IOTN-DHC, the abnormalities that were most frequently found on "great need" category include missing teeth and displacement of contact teeth. A lot of students experienced loss of tooth, including tooth extraction and one of the causes of tooth crowding was premature loss of deciduous teeth.[7] If the space of lost tooth was left alone for a long period and not replaced with a denture, it will result in inclination changes of the adjacent teeth toward the space of the lost tooth (tipping), thus causing malocclusion and other tooth health problems.[13] Deciduous teeth serve as a guide for permanent teeth, thus if extracted early, then the permanent teeth will lose its direction, thus erupting not on its place, causing crowding.[7]

According to gender, the orthodontic treatment needs in female students was higher compared to male students. This was in

accordance with Rezalinoor, in which "no/little need" category was mostly found in male students, while "moderate need" and "great need" were mostly found in female students.[7] This was caused by difference of jaw growth, in which in female was faster compared to male. The size of maxilla and the mandible in girls is smaller compared to boys. This is supported by the theory that the bone height of males are bigger compared to female, thus the dental arch width in males tend to be bigger and longer than females.[14,15] Wilar stated that genetic factor also affected lack of space on dental arch due to discrepancy between tooth and jaw size received from the parents.[16]

According to the questionnaire results from PIDAQ, the higher the orthodontic treatment needs, the higher the psychosocial impact. This was in line with Viyanti and Susi who used IOTN AC, in which the higher the IOTN grade, the higher the PIDAQ total score. It means that the poorer the tooth aesthetic, the higher the negative impact on psychosocial condition of participants. Participants with higher grade of tooth appearance felt bigger psychosocial impact compared to participants with lower grade tooth appearance.[5] Psychosocial factor of adolescents in general can be seen from physical development, biological and motoric function, observation and thinking, life motive, social relation and integrity to the community. Other than that, other external factors include improved self-awareness/psychological maturity, self-confidence, social status, gender, education level, economy and knowledge. According to Calhoum and Acocella, the characteristics of negative self-concept are sensitive to criticism, tend to feel disliked by others, pessimist, irregular view of self, and instability. These conditions are often found in adolescents.[6]

The psychosocial condition of adolescents according to gender showed that 30 male students scored an average PIDAQ score of 34.20 and 46 female students scored an average PIDAQ score of 39.59. The data showed that female students had higher psychosocial level compared to male students. According to Song Yi, psychosocial problems in females were higher compared to males. This occurred because females are more attentive to dentofacial appearance, high self-perception, and higher social and psychological impacts compared to males.[11]

According to Ningsih and Oley, females tend to maintain their oral health more diligently compared to males. Males had lower emotional control compared to females, and most males did not care about their oral health condition which may cause malocclusion because they had more priority on their hobbies, considering more hobbies that can be chosen by males compared to females.[2,17] Based on the findings of this research, it can be concluded that there was a significant correlation between orthodontic treatment needs with psychosocial condition of adolescents.

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