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**CORRELATION BETWEEN MALOCCLUSION AND HISTORY OF BULLYING
 IN ADOLESCENTS AT MTSN 2 TANAH LAUT SOUTH KALIMANTAN**

Widyandini Aulia Arif^{1)*}, **Melisa Budipramana**²⁾, **Galuh Dwinta Sari**³⁾, **Muhammad Yanuar Ichrom Nahzi**⁴⁾, **Isnur Hatta**⁵⁾

¹⁾Preclinical Dentistry Program, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin, Indonesia

²⁾Department of Orthodontics, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin, Indonesia

³⁾Department of Psychology, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin, Indonesia

⁴⁾Department of Conservative Dentistry and Endodontics, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin, Indonesia

⁵⁾Department of Dental Public Health, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin, Indonesia

ABSTRACT

Background: Bullying in schools has been a source of concern for societies all over the world. The physical aspect is one of the triggers for bullying in adolescents. Assessment of these physical aspects; such as, weight, height, and facial appearance include the condition of the teeth. Moreover, prominent conditions of malocclusion; such as, gaps between teeth, crowding, overbite and overjet, are the most frequently reported targets by bullies. **Purpose:** To analyze the relationship between malocclusion and history of bullying in adolescents at MTsN 2 Tanah Laut South Kalimantan. **Methods:** Cross sectional research design is the methodology used in this observational analytical study. ICON was used to assess malocclusion severity and a validated questionnaire adapted from previous research was used to assess bullying history. In addition, the samples obtained were 86 respondents aged 12-14 years. **Results:** The highest frequency distribution in this study is malocclusion in the easy category based on ICON by 41 people (47.7%) and history of bullying in the category of bullying has not happened to the respondent in the last two months as many as 69 people (57.4%). A significant correlation was found in the results of the Spearman analysis test between malocclusion based on ICON and a history of bullying. **Conclusion:** Malocclusion and history of bullying in adolescents at MTsN 2 Tanah Laut South Kalimantan are correlated in a one-way manner, meaning that the severity of the malocclusion category increases in tandem with the history of bullying category.

Keywords: Adolescents, Bullying, ICON, Malocclusion

Correspondence: Widyandini Aulia Arif; Faculty of Dentistry, Lambung Mangkurat University, Veteran Street No. 128B Banjarmasin 70249, South Kalimantan, Indonesia. Email: widyandinia@gmail.com

INTRODUCTION

Bullying is defined as a form of aggressive or hurtful behavior that is carried out intentionally and repeatedly.^{1,2,3} This behavior is characterized by an imbalance of power in a relationship.⁴ Bullying is not the same as joking in friendship relationships, an action can said to be bullying if the victim does not like the action.⁵

Bullying in schools has become a phenomenon that concerns people around the world.³ In Indonesia, since 1970 the term violence among students is better known as bullying.⁶ The act of bullying can occur directly, when it involves physical or verbal, and indirect, when it involves the manipulation of social relations by gossip or ostracism.² The direct form, which is verbal treatment associated with derogatory remarks, is the most

common form.² Victims of this behavior have psychological consequences; such as isolation, depression, anxiety; besides, it can lead to lower learning ability.⁷

Bullying in schools is an endemic problem, with reported prevalence ranging from 5% to 58% worldwide.⁸ From 2011 to 2019, the Indonesian Child Protection Commission (KPAI) received 37,381 reports, with 2,473 reports of bullying in education world and social media.⁹ According to the South Kalimantan Empowerment and Child Protection Service (DPPA), the number of cases of violence against women and children increased from 205 cases in 2017 to 215 cases in 2018.¹⁰

Several studies suggest that the under-14 age group in adolescents has a high prevalence of bullying.² It occurs due to adolescent self-esteem

which is associated with people's perceptions of their bodies.³ Furthermore, adolescence is a transitional period between childhood and adulthood in which many physical and emotional changes occur.³ There is a significant assessment of physical changes which is a form of integration and acceptance in social groups in adolescents.^{1,2} Physical aspects that distinguish the victim from other group members are one of the factors that trigger bullying in adolescents.² Assessment of these physical aspects; such as weight, height, and facial appearance include condition of the teeth.^{1,2} The dentofacial region contributes significantly to the facial appearance and aesthetics of the smile.² Therefore, misaligned teeth and/or lack of alignment between the maxillary and mandibular bones, or malocclusion is associated with a history of bullying.²

Malocclusion is a very common public health problem and several studies have shown its negative correlation with quality of life, self-esteem and social perception.² The visible aesthetic impact of malocclusion directly affects the way people see themselves and often influences the process of social interaction.¹ Improved dental aesthetics and psychological well-being are stated as the most common reasons for seeking orthodontic treatment during childhood and adolescence.⁸ In addition, prominent malocclusions; such as, gaps between teeth, crowding, overbite and overjet are most frequently reported as being targeted by bullies.^{1,2,8}

The percentage of malocclusion reaches 80% of the population and ranks third after periodontal disease and dental caries.¹¹ According to 2018 Basic Health Research (RISKESDAS) data, South Kalimantan is a province with a high percentage of dental and oral health problems which reaches a percentage of 59.6% with 12% cases of malocclusion.¹¹ The age group of 12-14 years is the age group with the highest malocclusion of other ages which reaches a percentage of 15.6%.^{12,13} In Tanah Laut regency of South Kalimantan, only 9.08% received treatment from dental professionals out of 52.63% calculated in the proportion of dental and oral problems.¹⁴ The 2018 RISKESDAS data contains the percentage of receiving orthodontic treatment in South Kalimantan residents by regency/city, but it has void data in Tanah Laut Regency.¹⁴

The Angsau Public Health Center's School Dental Health Business (UKGS) data were collected in a preliminary study which had been conducted by researchers in Tanah Laut regency. The data shows that there are 6 junior high school/equivalent under the responsibility of the Angsau Public Health Center. The existence of homogeneity in the 6 schools made the researchers decided to do simple random sampling and MTsN 2 Tanah Laut was chosen as the research location. In addition, the data

showed that only 30 out of 126 students who were examined could be categorized as having good dental and oral health. Dental and oral problems recorded were caries, calculus, persistence, and others (including malocclusion). Based on the above explanation, researchers are interested in studying the relationship between malocclusion and a history of bullying in adolescents at MTsN 2 Tanah Laut South Kalimantan. The purpose of this study was to analyze the correlation between malocclusion severity and bullying history in adolescents at MTsN 2 Tanah Laut South Kalimantan.

METHODS

This research was conducted after obtaining ethical approval from the Ethics Committee of the Faculty of Dentistry, Lambung Mangkurat University with No. 067/KEPKG-FKGULM/EC/IV/2023. This quantitative study used observational analytic method and cross-sectional approach. The population in this study were MTsN 2 Tanah Laut South Kalimantan students aged 12-14 years with a total of 692 people. The minimum number of students involved in this study was 85 after calculating using the proportion estimation formula. The final respondents in this study were 86 students who were obtained by simple random sampling technique and met the inclusion and exclusion criteria. The inclusion criteria in this study were students who agreed and obtained permission from their parents/guardians to participate in the study, students who had complete permanent teeth up to the first molars, and students who are not currently or have had orthodontic treatment. While the exclusion criteria in this study were uncooperative students.

The independent variable was the severity of malocclusion that measured by the ICON. Meanwhile, the dependent variable was the history of bullying measured by a questionnaire adapted from previous research and had been revalidated.¹⁵ The tools used in this study were personal protective equipment (masks, gowns, handscoons), stationery, head lamps, sterilization pouches, dental mirror, UNC probes, diagnostic tools, nierbekken, dental bib, informed consent sheets, ICON malocclusion examination sheets, and bullying history questionnaire sheets. In addition, the materials used in this study were dry wipes and sterilization materials.

Primary data collection included submission of informed consent, completion of a bullying history questionnaire, measurement of malocclusion severity with ICON, and analysis of the relationship between malocclusion severity and bullying history using a statistical analysis program. The measured data were subjected to editing, coding, entry, tabulation, and then statistically performed. Each data that has been collected was then presented descriptively to describe

the characteristics of each variable, namely the independent variable in the form of malocclusion severity and the dependent variable in the form of a history of bullying. Bivariate data analysis was conducted to see the relationship between the two data using the Spearman Test.

RESULT

Table 1. Characteristics of Research Respondents Based on Gender

| Gender | N | % |
|--------|----|-------|
| Male | 30 | 34,9% |
| Female | 56 | 65,1% |
| Total | 86 | 100% |

Table 1 shows that the number of female respondents is greater than the number of male respondents. The number of female respondents are 56 people with a percentage of 65.1%, while the number of male respondents are 30 people with a percentage of 34.9%.

Table 2. Characteristics of Research Respondents Based on Age

| Age | N | % |
|----------|----|-------|
| 12 tahun | 10 | 11,6% |
| 13 tahun | 34 | 39,5% |
| 14 tahun | 42 | 48,9% |
| Total | 86 | 100% |

Table 2 shows that the highest number of respondents in this study was 14 years old as many as 42 people with a percentage of 48.9%. In addition, the least number of respondents was at the age of 12 years as many as 10 people with a percentage of 11.6%.

Table 5. Bullying History Category Based on Malocclusion Category of Research Respondents

| Bullying History Category | Malocclusion Category | | | | | | | | | |
|--|-----------------------|-------|------|-----|----------|------|-----------|------|----------------|------|
| | Easy | | Mild | | Moderate | | Difficult | | Very Difficult | |
| | n | % | n | % | n | % | n | % | n | % |
| Bullying has not happened to the respondent in the last two months | 39 | 45,3% | 25 | 29% | 4 | 4,7% | 0 | 0% | 1 | 1,2% |
| Bullying happened to the respondent once or twice in the last two months | 2 | 2,3% | 6 | 7% | 3 | 3,5% | 2 | 2,3% | 3 | 3,5% |
| Bullying occurs to respondents 2 or 3 times a month | 0 | 0% | 0 | 0% | 1 | 1,2% | 0 | 0% | 0 | 0% |
| Bullying happens to respondents once a week | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Bullying happens to respondents several times a week | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Total | 41 | 47,7% | 31 | 36% | 8 | 9,3% | 2 | 2,3% | 4 | 4,7% |

Table 5 shows that the most respondents were in the bullying history with the category of bullying has not happened to the respondent in the last two months with malocclusion in the easy category, totaling 39 people with a percentage of 45.3%.

Table 3. Malocclusion Category Based on ICON of Research Respondents

| Malocclusion Category | N | % |
|-----------------------|----|-------|
| Easy | 41 | 47,7% |
| Mild | 31 | 36% |
| Moderate | 8 | 9,3% |
| Difficult | 2 | 2,3% |
| Very Difficult | 4 | 4,7% |
| Total | 86 | 100% |

Table 3 shows that the respondents who have the highest degree of malocclusion severity are in the easy category as many as 41 people with a percentage of 7.7%. In addition, the least number of respondents are in the difficult category as many as 2 people with a percentage of 2.3%.

Table 4. Bullying History of Research Respondents

| Bullying History Category | N | % |
|--|----|-------|
| Bullying has not happened to the respondent in the last two months | 69 | 80,2% |
| Bullying happened to the respondent once or twice in the last two months | 16 | 18,6% |
| Bullying occurs to respondents 2 or 3 times a month | 1 | 1,2% |
| Bullying happens to respondents once a week | 0 | 0% |
| Bullying happens to respondents several times a week | 0 | 0% |
| Total | 86 | 100% |

Table 4 shows that the respondents who had the most bullying history were in the category of bullying that did not occur to the respondents in the last two months as many as 69 people with a percentage of 80.2%.

Table 6. Statistical Analysis of the Correlation between Malocclusion and History of Bullying in Adolescents at MTsN 2 Tanah Laut South Kalimantan

| | Malocclusion | Variable |
|----------------|--------------|------------|
| * Significance | 0,000* | History of |
| Correlation | 0,472 | Bullying |
| Coefficient | | |

* There is a significant relationship if $p < 0,05$.¹⁶

Based on statistical analysis in table 6, it is known that the significance value or Sig. (2 tailed) $0.000 < 0.05$, which means that there is a significant relationship between the severity of malocclusion and the history of bullying in this study.¹⁶ The correlation coefficient obtained is 0.472, which means that the level of strength of the relationship (correlation) between the independent variable, namely malocclusion, and the dependent variable, namely the history of bullying, is included in the moderate category.¹⁶ The correlation coefficient obtained is positive, so the relationship between the two variables is unidirectional, which means that the higher the category of malocclusion severity, the category of bullying history will also increase.¹⁶

DISCUSSION

Malocclusion in Adolescents at MTsN 2 Tanah Laut

Table 3 shows that the most respondents experienced malocclusion in the easy category, namely 41 people with a percentage of 47.7%, followed by the mild category as many as 31 people with a percentage of 36%, and the moderate category as many as 8 people with a percentage of 9.3%. The smallest number is in the difficult category as many as 2 people with a percentage of 2.3% and in the very difficult category as many as 4 people with a percentage of 4.7%. The results of this study are not much different from the results of 2017 research which had been conducted by Anggriani et al in Bali and 2018 research which had been conducted by Vidakovic et al in Croatia.^{17,18}

Research conducted by Anggraini et al 2017 in Bali had 90 respondents aged 12-15 years showed that the severity of malocclusion is easy 48.9%, mild 42.2%, moderate 6.7%, difficult 2.2%, and very difficult 0%.¹⁷ Meanwhile, 2018 research by Vidakovic et al in Croatia with a larger number of respondents also obtained similar results, namely from 1351 respondents the severity of easy malocclusion is 54.6%, mild is 34.7%, moderate is 5.3%, difficult is 3.3%, and very difficult is 2.1%.¹⁸ This shows that the severity of malocclusion in adolescents is mainly in the easy and mild categories, followed by the moderate category, and not many experience difficult or even very difficult severity.¹⁷

In the majority of cases, malocclusion and dentofacial abnormalities are not caused by some pathological process, but by developmental deviations from normal.¹⁹ Influential hereditary and congenital factors include characteristics inherited from parents, number and size of teeth, congenital deformities, conditions affecting the mother during pregnancy, and the fetal environment.²⁰ Acquired factors include premature loss and prolonged retention of primary teeth, abnormal habits, diet, trauma, metabolic and endocrine disorders.²⁰

Problems in occlusion most often result from a complex interaction between many factors affecting growth and development, making it difficult to pinpoint a specific etiologic factor.¹⁹

In addition, the change from a hard diet to a soft diet is an important etiologic factor for the increased prevalence of malocclusion.²¹ Previous studies have stated that mastication frequency and mealtime have decreased due to the advent of modern soft foods which can be swallowed and digested quickly.²² A decrease in masticatory strength due to increased consumption of modern soft foods has been associated with an increase in craniofacial deficiencies and the prevalence of malocclusion.^{22,23} Consumption of modern soft foods leads to reduced masticatory muscle strength and load transmitted to the mandible, affecting bone formation, especially at the attachment area of the masticatory muscles.²³

History of Bullying in Adolescents at MTsN 2 Tanah Laut

Table 4 shows that the most respondents are in the category of bullying that bullying has not happened to the respondent in the last two months, namely 69 people (80.2%). Respondents who experienced bullying can be seen in the bullying category that bullying happened to the respondent once or twice in the last two months as many as 16 people with a percentage of 18.6% and the category bullying occurs to respondents 2 or 3 times a month as many as 1 person with a percentage of 1.2%. The results of this study were reinforced by research by Kowalski et al in 2013 conducted in Pennsylvania with the results of 21% of 931 respondents are involved in bullying practices.²⁴ The results of this study are also in line with research conducted by Agel et al in 2014 in East London, where 21.7% of 728 respondents are victims of bullying practices.²⁵ This study is also not much different from the results of 2019 research by Veiga da Silva Siqueira et al in Brazil with the results of bullying prevalence of 29.6% of 381 adolescents who became respondents.³ However, the results of this study are less in line with the results of 2017 research by Gatto et al in Brazil which got a fairly high bullying rate of 48.22%.²⁶

According to Gatto et al, what makes the percentage of bullying in his study higher than other studies is that there is no time limit in the questionnaire used, in contrast to questionnaires in other studies that use time limits and also this study which uses the time limit of the last 2 months.²⁶ As a result of respondent's answers that are not limited in time, it increases the number of respondents who experience bullying.²⁶ Then according to Veiga da Silva Siqueira et al and Gatto et al, diverse research results can occur due to several factors, such as the methodology used in data collection, differences in the locations studied, the culture of each location, social class, race, age, and gender of respondents.^{3,26}

Socio-demographic diversity as well as differences in public policies and school environments in the population are also possible factors for the diversity of research results.³

Correlation Between Malocclusion and History of Bullying in Adolescents at MTsN 2 Tanah Laut

Table 5 shows that the largest distribution of respondents who experienced malocclusion is in the easy category with a history of bullying in the category which bullying has not happened to the respondent in the last two months. The number of respondents with both categories are 39 respondents with a percentage of 45.3%. The results of interviews with respondents with malocclusion without a history of bullying state that the time limit of the last 2 months is the reason for the absence of a history of bullying. Respondents stated that the last bullying incident occurred several months before the study was conducted. The bullying didn't happen again after that since the respondents no longer considered it as bullying, but only jokes between friends. This statement is in line with the statement of Scheffel et al, where Scheffel et al stated that the time period used to determine the frequency of bullying can be a factor which explains the variation in research results.⁷

The Spearman analysis test in table 6 shows that there is a unidirectional relationship between malocclusion based on ICON and the bullying history at MTsN 2 Tanah Laut adolescents. The results of this study are similar to the research of Tristão et al in 2020 which is a systematic review of nine studies with the conclusion that malocclusion is associated with a history of bullying in adolescents.²

Tristão et al stated that children and adolescents with conspicuous malocclusion, such as extreme maxillary overjet (> 4 mm, > 6 mm, > 9 mm), very deep overbite, and having spaces between anterior teeth or missing teeth, will be more often exposed to bullying than those with normal occlusion.² Tristão et al's statement is supported by the 2013 results of Al-Bitar et al in Jordan and Bazán-Serrano et al in 2017 in Peru.^{4,27} This is related to the fact that children or adolescents with normal dental appearance are perceived as prettier, smarter, and friendlier, whereas children or adolescents with poor appearance are more vulnerable to bullying since it is impossible to hide a dentofacial condition during social contact.²

Research by Ramos et al in 2022 conducted in Brazil was not in line with this study where Spearman's correlation analysis showed that malocclusion is not associated with a history of bullying.²¹ Ramos et al stated that a factor that could be the cause of the variability of these results is the finding of an association between increased self-perception of the need for orthodontic treatment and

increased maxillary overjet.¹ This occurs because increased overjet is one of the occlusal conditions that most affects the aesthetics of the smile and affects the quality of life related to oral health.¹ The 2018 study by Quito-Rabanal et al in Peru using Kruskal Wallis statistical analysis also showed different results from this study, namely a value of $p = 0.295$ ($p > 0.05$) or obtained insignificant differences between the various types of malocclusion according to Angle's classification with a history of bullying.¹⁵ Quito-Rabanal et al stated that the absence of this difference occurred due to malocclusion in the anteroposterior does not significantly affect the social life of students.¹⁵ Another explanation is that dentofacial features of the anterior teeth may more strongly contribute to a history of bullying.¹⁵ This explanation is in line with 2013 research by Al-Bitar et al in Jordan which states that the presence of spaces between teeth, missing teeth, anterior openbite, and prominent upper front teeth are associated with a history of bullying.²⁷

This study has several limitations; such as, it does not analyze statistically the causal relationship between the variable severity of malocclusion and history of bullying; besides, this study does not analyze statistically between categories on the variable severity of malocclusion and history of bullying. In addition, this study does not identify and analyze other factors which could affect the severity of malocclusion such as modern soft eating patterns, history of bullying such as social class and race, as well as the relationship between the severity of malocclusion and history of bullying such as knowledge of malocclusion conditions and the impact of reduced aesthetics resulted, environmental conditions (family income, parental education, government assistance, and parental employment), emotional and social health, and personal perceptions of the need for orthodontic therapy.¹

Based on the results of this study, it can be concluded that there is a significant relationship between the two variables. Malocclusion and history of bullying in adolescents at MTsN 2 Tanah Laut South Kalimantan are correlated in a one-way manner, meaning that the severity of the malocclusion category increases in tandem with the history of bullying category.

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