ORTHODONTIC TREATMENT NEEDS IN STUDENTS 12-15 YEARS USING ORTHODONTIC TREATMENT NEEDS INDICATOR (IKPO) IN BANJARMASIN

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ABSTRACT
Background: Based on the data from Riskesdas (Primary Health Research) of 2013, the prevalence of malocclusion in 12-15 years old in the Province of South Kalimantan was 5.6%, which was the age group with the highest malocclusion over other age groups. Malocclusion itself is a dental abnormality that ranks third after dental caries and periodontal disease in oral health problems in Indonesia with a very high prevalence of around 83.3%. Treatment for malocclusion condition can be performed by orthodontic treatment. One of the indexes for measuring orthodontic treatment needs is IKPO (Orthodontic Treatment Needs Indicator). This indicator is highly suitable to be used as an instrument to find out the orthodontic treatment needs of students, especially in Indonesia. Objective: To find out the level of orthodontic treatment needs in students 12-15 years old using Orthodontic Treatment Needs Indicator (IKPO) according to age and gender. Methods: The study conducted was quantitative descriptive research with a cross-sectional approach. Samples were 108 students of 12-15 years old in 5 Junior High Schools in Banjarmasin. Every sample filled out IKPO questionnaires to asses orthodontic treatment needs. Results: The results of the study showed that 88% of respondents need orthodontic treatment. This consisted of 58 female students and 37 male students. The age group that required the most orthodontic treatment in this study was 12 years old. Conclusion: Orthodontic treatment needs in students 12-15 years old were high in Banjarmasin, which was measured using IKPO.

Keywords: Malocclusion, Orthodontic Treatment Needs Indicator (IKPO), Adolescent
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INTRODUCTION

Malocclusion is an occlusion abnormality that caused by growth, position, teeth size, and irregular jaw. Malocclusion is a condition where the teeth are not in the normal position in the dental arch or with the opposing teeth. Malocclusion has two main factors, hereditary factors and environmental factors.[1] Hereditary factor is the main influence on malocclusion, whereas heredity factor influences the size, shape, and number of teeth that do not grow according to the dental arch so it causes crowding. Several sources stated that environmental factor, such as bad habit, also has considerable influence on malocclusion.[2,3]

The prevalence of dental health problems in Indonesia is still quite high. According to the Primary Health Research (Riskesdas) of 2018, the prevalence of dental and oral problems from 13 regencies/cities in the Province of South

Kalimantan was 58.60%.[1] Data from Riskesdas of 2013 also showed that the prevalence of malocclusion in 12-15 years old in the Province of South Kalimantan was 15.6%, which was the age group with the highest malocclusion over other age groups. Common case in oral cavity that still found nowadays are malocclusion. [4,5]

Malocclusion itself is a dental abnormality that ranks third after dental caries and periodontal disease in oral health problems in Indonesia with a very high prevalence of around 83.3%. The high rate is due to the low level of awareness of dental care.[1,2] Treatment for malocclusion can be performed by orthodontic treatment. The purpose of orthodontic treatment is to correct the position and alignment of the teeth, restore chewing function, and prevent an abnormal condition of the face shape. Currently, many children and adults have used orthodontic appliances, especially adolescents.[6,7]

Adolescence, according to Santock (2011), is a transition period that bridges childhood and adulthood. Adolescence is a developmental change from childhood to adulthood, that causes the changes of physical, cognitive, and psychosocial.[8] The age limit categorized as an adolescent in Indonesia is 11-24 years old.[9]

During adolescence, the changes of physical, mental, and psychosocial occur. The changes make adolescents often feel dissatisfied with their facial appearance because this is very important to physical appearance.[7] Currently, many adolescents with malocclusion did not take the recommended to treat the malocclusion. This is because they do not feel that they have malocclusion and do not know that they need orthodontic treatment. This can be caused by the different perceptions of each individual regarding the dental condition or due to the lack of knowledge about malocclusion and its treatment.[10]

The different perceptions in assessing malocclusion, the relation to orthodontic treatment, and various purposes of orthodontic treatment generate several indexes of orthodontic treatment needs, one of which is IKPO (Orthodontic Treatment Needs Indicator) to measure the orthodontic treatment needs made by Hoesin. This indicator is highly suitable to be used as an instrument to find out the orthodontic treatment needs in school-age children, especially in Indonesia.[11] The use of this index is very convenient by calculating the score of the awareness, knowledge, and willingness that are obtained from filling out the questionnaire.[2]

The results of the study conducted by Utari and Putri (2019) regarding the orthodontic treatment needs according to IKPO in Mid School Muhammadiyah 3 Yogyakarta obtained that 61% of respondents need orthodontic treatment and 39% of respondents do not need orthodontic treatment.[11] Moreover, based on the study conducted by Nurhaeni (2017) concerning the orthodontic treatment needs using IKPO in students obtained that 93% of respondents need orthodontic treatment and only 7% of respondents do not need orthodontic tretament.[13]

The aim of using IKPO in this study is to measure the orthodontic treatment needs in students of 12-15 years old in Banjarmasin according to age and gender.

METHODS

This research was conducted after obtaining ethical approval from the Ethical Committee of the Dentistry Faculty, Lambung Mangkurat University with No. 079/KEPKG-FKGULM/EC/VIII/2022. The research method used was quantitative descriptive research with a cross-sectional approach. The subjects of the study were 108 students 12-15 years old who had never or were not undergoing orthodontic treatment.

The study was conducted in 5 Junior High Schools in Banjarmasin by giving informed consent and questionnaires directly to each subject of the study. In filling out the IKPO questionnaire, the subject of the study was guided directly by the researcher and every answer was multiplied by the score weight and sum of each score. Score 0-13 was categorized as needing orthodontic treatment while score 14-23 was categorized as not needing orthodontic treatment. The data analysis used was univariate analysis using Microsoft Excel 2021 and the questionnaire used has been tested for its validity and reliability using SPSS program.

RESULTS

The results of the study showed that the level of orthodontic treatment needs in 5 Junior High Schools in Banjarmasin according to IKPO was high, which was 95 respondents (88%) who need orthodontic treatment consisting of 58 females and 37 males.

Table 1. The Percentage Distribution of Orthodontic Treatment Needs According to IKPO

Research Criteria	Amount	Percentage
Need Treatment	95	88%
No Need Treatment	13	12%
Total	**108**	**100%**

Based on Table 1 regarding the percentage distribution of orthodontic treatment needs according to IKPO, it showed that 88% of respondents need orthodontic treatment and only 12% of respondents do not need orthodontic treatment.

Table 2. Distribution of Frequency and Percentage of Orthodontic Treatment Need According to IKPO

IKPO	N	%	F	%	M	%
Need Treatment	95	88%	58	54%	37	33%
No Need Treatment	13	12%	8	8%	5	5%

Based on Table 2 regarding the distribution of frequency and percentage of orthodontic treatment needs according to IKPO, it was obtained that the need orthodontic treatment category has the highest frequency of 95 respondents (88%) than the no need treatment category. Based on gender, it can be found that female subjects need more orthodontic treatment, which was 58 respondents (54%), than male subjects.

Table 3. Distribution of Frequency of Orthodontic Treatment Needs According to Age

Age	Need Treatment	Percentage (%)	No Need Treatment	Percentage (%)
12	35	100%	0	0%
13	26	90%	3	10%
14	18	78%	5	22%
15	16	76%	5	24%

Based on Table 3 regarding the distribution of Frequency of the orthodontic treatment needs according to age, it was obtained that the age category that needs the most orthodontic treatment was 12 years old with 35 respondents. Meanwhile, respondents who do not need orthodontic treatment with the smallest frequency were 12 years old of 0 respondents (0%).

Table 4. Distribution of Respondents Score Who Do Not Need Orthodontic Treatment

IKPO Score	Amount	Percentage (%)
14	3	3%
15	0	0%
16	3	3%
17	5	5%
18	0	0%
19	0	0%
20	2	2%
21	0	0%
22	0	0%
23	0	0%
Total	**13**	**12%**

Based on Table 4, it can be obtained that the number of respondents who do not need orthodontic treatment was 13 respondents, in which the highest distribution at a score of 17 was 5 respondents (5%). Moreover, the lowest distribution at a score of 15,18,19,21,22, and 23 was 0 respondents (0%).

Table 5. Distribution of Respondents Score Who Need Orthodontic Treatment

IKPO Score	Amount	Percentage (%)
0	13	12%
1	0	0%
2	0	0%
3	22	20%
4	6	6%
5	0	0%
6	16	15%
7	12	11%
8	0	0%
9	3	3%
10	15	14%
11	5	5%
12	1	1%
13	2	2%
Total	**95**	**88%**

Based on Table 5 above, it can be obtained that the number of respondents who need orthodontic treatment was 95 respondents, in which the highest distribution at a score of 3 was 22 respondents (20%), while the lowest distribution at a score of 1, 2, 5, and 8 was 0 respondent (0%).

Table 6.   Distribution of Frequency of Orthodontic Treatment Needs According to Gender

Age	Need Treatment	F	%	M	%	No Need Treatment	F	%	M	%
12	35	20	19%	15	14%	0	0	0%	0	0%
13	26	18	17%	8	7%	3	3	3%	0	0%
14	18	11	10%	7	6%	5	2	2%	3	3%
15	16	9	8%	7	6%	5	3	3%	2	2%
Total	**95**	**58**	**54%**	**37**	**33%**	**13**	**8**	**8%**	**5**	**5%**

Results obtained from Table 6 showed that the most respondents who need orthodontic treatment are female of 20 respondents and male of 15 respondents in the age group of 12 years old.

DISCUSSION

This study used indexes of the Orthodontic Treatment Needs Indicator (IKPO) in the form of a questionnaire to assess the orthodontic treatment needs, which is highly suitable to assess orthodontic treatment needs in school-age children, especially in Indonesia.[11]

Analysis of univariate data was carried out to overview the characteristics of each variable, which was the level of orthodontic treatment needs in students 12-15 years old. The level of orthodontic treatment needs obtained the highest result of the respondents needing treatment, which were 95 respondents (88%). This is also shown in the study by Sinulingga et al. (2010), which stated that 91.7% of the adolescent population in 12-15 years old need orthodontic treatment.[14] Plenty high percentage is also found in the study by Jelita et al. (2021), which stated that 94% and 86% of respondents in 12-15 years old need orthodontic treatment from 2 schools studied.[15] Treatment needs in this study are reflected in subjects' awareness of their teeth conditions and knowledge about dental and oral health obtained from filling out the questionnaire.[11] According to the study conducted by Syada, et al. (2017), the availability of health services in the school influences the level of orthodontic treatment needs. Actions from the school health unit, such as promotive, preventive, curative, and rehabilitative, can influence the level of knowledge related to health care, especially dental and oral.[16]

Based on the results of the distribution of frequency and the percentage of orthodontic treatment according to IKPO, it showed that the students who need treatment were 58 female students and 37 male students. From this result, the need orthodontic treatment category was found more in females than males. This is in accordance with the study conducted by Hansu, et al. (2013), which stated that most males do not care about dental and oral problems that can cause malocclusion. Otherwise, females are more aware of their physical conditions, especially the appearance of their teeth so if they have malocclusion, they will respond more quickly to prevent malocclusion by visiting the dentist.[10] The study by Rezalinoor et al. (2007) stated that respondents who need the most treatment are women than men.[17] This is also related to the theory that the length of male bone is longer than female so the width of the dental arch in males is bigger and longer than in females, so it becomes one of the factors causing malocclusion.[18,19]

The results of the analysis obtained that, based on the age category, students who need the most orthodontic treatment are 12 years old of 35 respondents (100%). Based on the study by Feroza, et al. (2017), it found that 14 years old is the most age needing treatment.[12] However, according to Herwanda, et al. (2016), the age factor does not really influence the level of treatment needs, where the level of knowledge of each age level is still in the same category.[20] In this study, the age difference is also not really different, which is only 1 year and still in one phase called early adolescence so the level of knowledge of each age category is still relatively the same. The geographical location of an area also affects the value of orthodontic treatment needs as stated in the study by Nurhaeni (2017), where different people in different areas will influence the perception or response of the orthodontic treatment needs, such as words and behavior of the people around them.[13] Based on the study by Perwira (2017), according to the theory, the age group that really needs orthodontic treatment is 12 years old age group. 12 years old is a process where most of the permanent teeth erupt at the same time, such as caninus, first premolar, and second premolar so that it can establish the teeth' position and can have a major impact on the teeth displacement. Thus, at this age, it is susceptible to

reverse overjet, crossbite anterior/posterior, displacement contact point, open bite anterior/posterior, and deep overbite.[21]

Data from the results of the distribution of the respondents who need orthodontic treatment, according to IKPO, were the score 0-13 of 95 respondents. This is in line with the results of the study by Nurhaeni (2017), in which 28 of the 30 respondents need orthodontic treatment assessed from the distribution of IKPO score. This showed that the level of orthodontic treatment needs in students 12-15 years old in Banjarmasin is quite high. This is affected by the knowledge, awareness, and surrounding environment.[13]

Data from the results of the distribution of the respondents who do need orthodontic treatment, according to IKPO, were the score 4-23 of 13 respondents. Respondents who do not need orthodontic treatment in this study can be affected by several factors. The factor includes a lack of awareness about the importance of maintaining dental and oral health, this case is the result of malocclusion or deviating from the normal arrangement and is most likely due to economic conditions or dental care costs.[13] The level of orthodontic treatment needs in 5 Junior High Schools in Banjarmasin according to IKPO is high, which is 95 respondents (88%) who need orthodontic treatment, consisting of 58 females and 37 males. According to the age category, it obtained that respondents who need the most orthodontic treatment are 12 years old of 35 respondents (100%), consisting of 20 female respondents and 15 male respondents.

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