

Prevalence of malocclusion using cephalometric radiography in RSGM Unhas

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Prevalence of malocclusion using cephalometric radiography in RSGM Unhas

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Objective: The purpose of this study was to determine the prevalence of malocclusion using cephalometric radiography in RSGM Unhas. **Methods:** This research is descriptive observational with purposive sampling research design. The study population is all cephalometry radiographic data of patients who viewed from medical record data from May 2016 – May 2017. The data obtained then processed in the form of tables and diagrams. **Results:** The results showed that the prevalence of malocclusion based on skeletal classification of malocclusion was on skeletal class I with percentage 28.6%, skeletal class II with percentage 34.3% and skeletal class III with percentage 37.1%. Prevalence of malocclusion by gender is in males with percentage 42.9% and females with percentage 57.1%. In majority males experienced skeletal malocclusion class III with percentage 40% while in majority females experienced class II malocclusion with percentage 40%. While based on age group that is on children with percentage of 2.9%, adolescents with percentage 71.4%, adults with percentage of 17.1% and elderly with percentage of 8.6%. **Conclusion:** The prevalence of malocclusion based on skeletal classification of malocclusion was on skeletal class I with percentage 28.6%, skeletal class II with percentage 34.4% and skeletal class III with percentage 37.1%.

Keywords: analysis, cephalometric, malocclusion, radiography.

PRELIMINARY

According to the World Health Organization (WHO), malocclusion is a defect or functional disorder that can be a hindrance to the physical and emotional health of patients in need of care. Malocclusion is a dentofacial abnormal state that interferes with the function of mastication, ingestion, speech and harmony of the face. In Indonesia, the prevalence of malocclusion reaches 80% and becomes a dental and oral health problem after caries and periodontal disease.^{1,2}

Orthodontics is one of the branches of dentistry that studies facial growth, dental development, occlusion, and studies the diagnosis, prevention and treatment of occlusion anomalies. The aims of orthodontic treatment are to improve occlusion and abnormal tooth conditions to improve aesthetics and functions of mastication.^{1,2}

Assessment of the success of orthodontic treatment is based on a complete diagnosis and treatment plan. Diagnosis and treatment plan of malocclusion is done based on clinical examination, model analysis, radiographic analysis, profile and face. Radiographic analysis is one of the investigations carried out in helping to establish a diagnosis of the case as well as the plan of care to be performed. Radiography is used to provide information about the invisible oral structure of the oral cavity.^{4,5}

Radiography is the production of radiographic image of an object by utilizing x-ray. In dentistry, there are two kinds of radiography techniques: intraoral radiography and extraoral radiography. The radiographic technique used in orthodontic treatment is extraoral radiography that is cephalometric technique.^{5,6}

Cephalometric radiography is a standard method for obtaining skull bone radiographic images that is use for making treatment plans and examining the progress of patient. Cephalometry is defined as the study of quantitative measurements of a particular part of the head for information about craniofacial patterns.^{7,8}

Researchers want to know the prevalence of malocclusion using cephalometric radiography.

RESEARCH METHOD

¹³ This study used descriptive observational method with a cross sectional study design in which the sample taken in the form of radiographic data cephalometry patient. This research was conducted in April-May 2017 at the Department of Radiology at RSGM Unhas.

The population of this research is radiographic data of cephalometric patient at RSGM Unhas starting from May 2016-May 2017. The sampling technique used in this research is ¹⁰ non-probability sampling method in the form of purposive sampling. This sampling method is a sampling technique that is done based on the characteristics set against target population tailored to the purpose of the study. After obtaining the data, the cephalometry photograph is then

performed manual tracing to determine the diagnosis using Steiner analysis. The results are then processed in tabular form using SPSS system.

RESULT

From the result of the research, it is found that there are 35 people malocclusion. The results obtained from this study are as follows.

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Table 5.1 Distribution of sample based on gender

Gender	Frequency	Percent
Males	15	42,9%
Females	20	57,1%
Total	35	100%

From above table it can be seen that from 35 samples of research on cephalometric photo data at Radiology Department RSGM Unhas there are 15 (42,9%) males and 20 (57,1%) females.

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Table 5.2 Distribution of sample based on age category

Age Category	Frequency	Percent
Children	1	2,9%
Adolescent	25	71,4%
Adult	6	17,1%
Elderly	3	8,6%
Total	35	100%

In the table above, it can be seen that in the cephalometric photo data by age category there are 1 (2,9%) children, 25 (71,4%) adolescent, 6 (17,1%) adult, and 3 (8,6%) elderly

Table 5.3 Distribution of sample based in classification of skeletal malocclusion

Classification of malocclusion	Frequency	Percent
Skeletal Class I	10	28,6%
Skeletal Class II	12	34,3%
Skeletal Class III	13	37,1%
Total	35	100%

In the table above, it can be seen that in the cephalometric photo data based on classification of skeletal malocclusion there are 10 (28.6%) cephalometric photo data experienced skeletal malocclusion class I, 12 (71.4%) cephalometric photo data experienced skeletal malocclusion class II, and 13 cephalometric photo data experienced skeletal malocclusion class III.

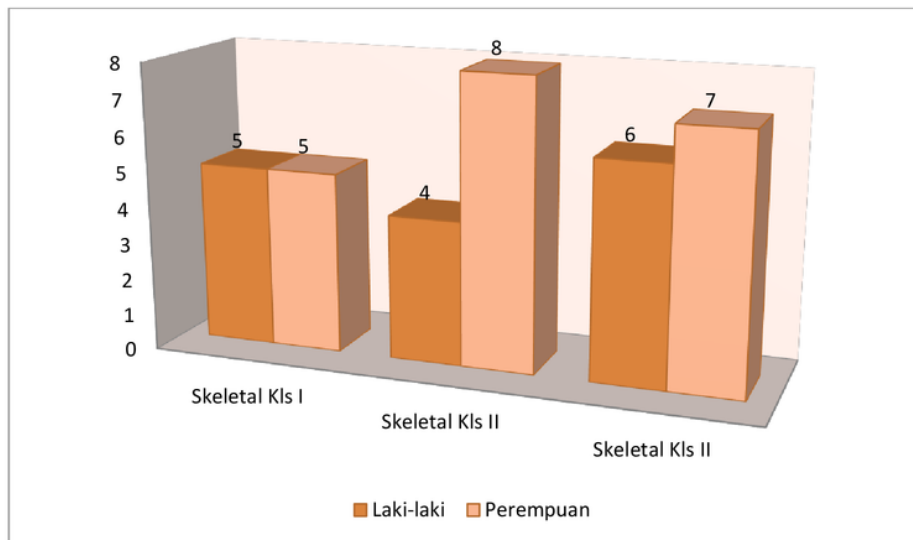


Figure 5.1 Graphic of skeletal malocclusion prevalence based on gender

Table 5.4 Prevalence of malocclusion based on gender

Gender	Frequency	Total
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	Class I		Class II		Class III		n	%
	n	%	n	%	N	%		
Males	5	33,3	4	26,7	6	40	15	100
Females	5	25	8	40	7	35	20	100
Total	10	28,6	12	34,3	13	37,1	35	100

In the table above, it can be seen that in cephalometry photo data there are 5 (33,3%) male and 5 (25%) women having skeletal malocclusion class I, 4 (26,7%) males and 8 (40 %) females had skeletal malocclusion class II, and there were 6 (40%) males and 7 (35%) females had skeletal malocclusion class III.

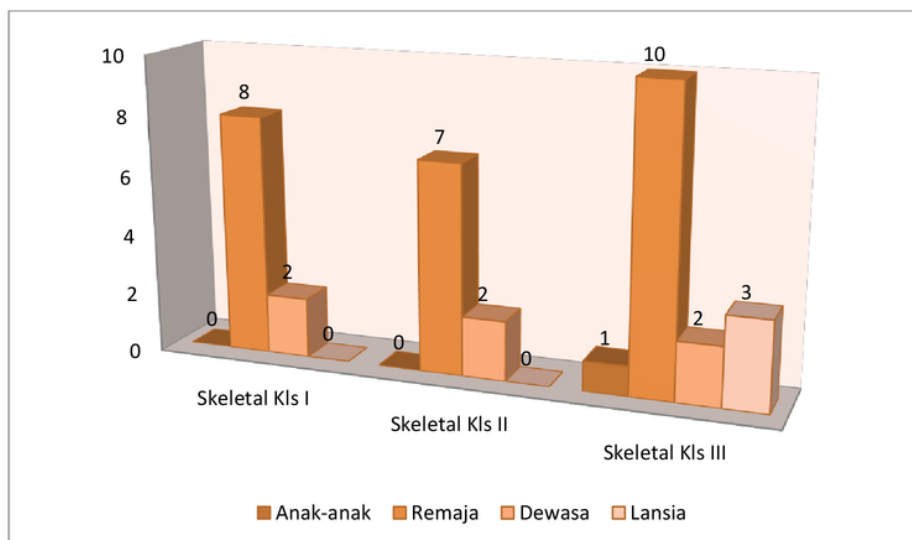


Figure 5.2 Prevalence of malocclusion based on age category

Table 5.5 Prevalence of malocclusion based on age category

Age Category	Frequency						Total	
	Class I		Class II		Class III		n	%
	n	%	n	%	n	%		
	4							

Children	0	0	0	0	1	100	1	100
Adolescent	8	32	7	28	10	40	25	100
Adult	2	33,3	2	33,3	2	33,3	6	100
Elderly	0	0	3	100	0	0	3	100
Total	10	28,6	12	34,3	13	37,1	35	100

In the table above, it can be seen that in the cephalometric photo data with skeletal malocclusion class I was not found in the age group of children, 8 (32%) in the adolescent age group, 2 (33.3%) in the adult age group and none in elderly groups. Class II skeletal malocclusion cases were absent in the age group of children, 7 (28%) in the adolescent age group, 2 (33.3%) in the adult age group and 3 (100%) in the elderly group. In the case of skeletal malocclusion class III of total cases in the age group of children there were 1 (100%) cases, and in the case of class III malocclusion there were also 10 (40%) in the adolescent age group, 2 (33.3%) groups Adult age and not present in elderly group.

DISCUSSION

This study used cephalometric photo data consisting of male and female subjects and consisted of all age groups. The classification of malocclusions that can be determined by cephalometric photographs is the classification of skeletal malocclusion by tracing first and then determining the case diagnosis based on cephalometric analysis, ie Steiner analysis.

Table 5.1 shows the distribution of the sample by gender. It is known that the total sample / cephalometric photo data for malocclusion cases was found in males as much as 15 (42.9%) and females as many as 20 (57.1%). This shows that based on data collected, female is more than male gender. The results of this study are in accordance with the research conducted by Citra et al (2014) regarding the distribution of malocclusion frequency of orthodontic patients by gender was found in males as many as 68 samples (18.5%) and females as many as 290 samples (81.5%).²⁹

In the study it was found that specialization for orthodontic treatment was more prevalent in female patients than in male patients because females tended to pay more attention to aesthetic factors. Therefore, samples with female were more common in cephalometric photo data.³⁰

³ Table 5.2 shows the distribution of the sample by age group. This age group according to the Ministry Of Health RI in 2009 with the categories of children age group ⁸ (5-11 years), adolescents (12-25 years), adults (26-45 years) and elderly (46 years and over). It is known that the total sample for malocclusion cases is found in children age group of 1 (2.9%), adolescent age group is 25 (71,4%), adult age group is 6 (17,1%), and group Elderly as much as 3 (8.6%). This indicates that malocclusion cases are most prevalent in adolescent age group of 71.4%.

¹ The results of this study are in line with research conducted by Oktavia (2008) in Medan which shows that ¹² the prevalence of malocclusion in adolescents is still relatively high at 60.5%. In addition, according to the study the ¹ prevalence of malocclusion in adolescents in Indonesia is still high, starting from 1983 is 90% to 2006 is 89%. This is related to the growth period of the jaw that is mature maturity of the maxillary bone and mandible, which stops at the age of 18 years and ¹¹ the need for orthodontic treatment in adolescents.³¹

According to the results of a study by Oktavia (2008) the need for care by adolescents is 23%. This is followed by complaints related to dental health. In this study, found the highest complaints of the seven dimensions of quality of life that are often felt by respondents, namely tooth pain (64.41%), irritability (47.22%), embarrassment (43.58%), aware of dental problems (41.40%), unable to taste well (35.1%) and unable to learn well (20.82%). Judging from the percentage of complaints that are often felt, most of the complaints are aesthetic problems, this is supported by research by Mandall et al (1999) in 14-15 year old teenagers who are shy to smile and always try to cover their mouth because of the problem of malocclusions.³¹

Table 5.3 shows the distribution of samples based on the skeletal malocclusion classification of 10 (28.6%) class skeletal cases, 12 (34.3%) skeletal cases of class II and 13

(37.1%) class III skeletal cases. This shows that malocclusion cases are most common in cases of skeletal class III malocclusion. The results are also in accordance with research by Riandri et al (2006), in the literature mentioned that malocclusion in Asia is more common in Asia. Based on a study by Lew et al. The prevalence of class III malocclusion is 12% of the population. While according to Ishii the prevalence of this type in Japan is about 4% -13% and Kang et al found about 16,7% class III prevalence in Korea.³²

Malocclusion class III results from the interaction of heredity and local factors The growth pattern and size of the mandibular base are genetically inherited. Local factors that can cause or aggravate class III malocclusions include the form of a flat tongue and more to the anterior so that the mandibular arch is wider and the maxillary curve is narrower, the habit of moving the mandible to anterior, breathing through the mouth, or obstruction of the upper airway. Anterior guidance that is not normal can also trigger a class III relationship.³²

Table 5.4 shows the prevalence of skeletal malocclusion by gender. Based on the table, there were 5 (33,3%) males and 5 (25%) females having skeletal malocclusion class I, 4 (26,7%) males and 8 (40%) females having skeletal malocclusion class II , And there were 6 (40%) males and 7 (35%) females had skeletal malocclusion class III. This shows that in the case of skeletal malocclusion most commonly found is skeletal class II in females as many as 8 cases (40%). This is in line with research conducted by Aslam et al (2010). The results showed that of the total sample, as many as 810 cases in females had skeletal malocclusion class II compared with men who experienced skeletal class II as many as 375 cases. This relates to the level of need for care for aesthetic reasons where it is reported that females get more orthodontic treatment than males.³³

Table 5.5 shows the prevalence of skeletal malocclusion by age group. In the table it can be seen that in the cephalometric photo data experienced skeletal maloklusi class I is not found in the age group of children, 8 (32%) in the adolescent age group, 2 (33.3%) in the adult age group and not present in the elderly group. Class II skeletal malocclusion cases were absent in

the age group of children, 7 (28%) in the adolescent age group, 2 (33.3%) in the adult age group and 3 (100%) in the elderly group. In the case of skeletal malocclusion class III of total cases in the age group of children there were 1 (100%) cases, and in the case of class III malocclusion there were also 10 (40%) in the adolescent age group, 2 (33.3%) groups Adult age and not present in elderly group.

This shows that in the case of skeletal malocclusion most commonly found is skeletal class III in adolescent age group as many as 10 cases (40%). This result is in line with research by Almasri (2014) on the prevalence of skeletal malocclusion in Saudi Arabia showing that out of a total of 154 cases of skeletal malocclusion, 76 (49%) had skeletal class III, 60 (39%) had skeletal class II and As many as 19 (12%) have skeletal class I. In addition, some studies in Asia also showed that skeletal III is the most malocclusion cases. This is also in line with some studies in South America, Brazil where class III skeletal becomes the dominant case. Chew et al (2006) conducted a study in Singapore also showed similar results that is 68% of the total sample of 212 experienced skeletal class III.³⁴

Malocclusion abnormalities get more care in adolescence because of factors such as bone growth that can facilitate maintenance in order to get good results.³⁴

CONCLUSION

The result of the research shows the prevalence of malocclusion based on skeletal classification that is on skeletal class I with presentation 28,6%, skeletal class II with presentation 34,3% and skeletal class III with presentation 37,1%. Prevalence of malocclusion by gender is in males with presentation 42,9% and females with presentation 57,1%. In majority males experienced skeletal malocclusion class III with 40% presentation while in majority females experience class II malocclusion with presentation 40%. While based on age group that is on children with presentation of 2,9%, adolescents with presentation 71,4%, adults with presentation of 17,1% and elderly with presentation of 8,6%.

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