

Prevalence of Malocclusion During Puberty Growth Spurt in Grade X Students of SMA Seven at Gunung Samarinda Health Center

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Abstract

Malocclusion is an abnormal position of the jaw or teeth. Malocclusion ranges in severity from low to high, reflecting biological differences across individuals. Human growth and development varies, including bone growth during the accelerated growth period during puberty. Individual identification of the pubertal growth spurt period is very important in orthodontic treatment, because the best growth changes are achieved during the pubertal growth spurt. Purpose: This Study aimed to describe the prevalence of Malocclusion in Pubertal growth Spurt at class 10 students of 7 Senior High School during networking at Gunung Samarinda Community Health Center, Balikpapan East Kalimantan. Methods: A descriptive observational study with a cross-sectional design was conducted. There were 1339 students recruited in the screening session.

Keywords: Protrusion, Crowding, Crossbite, Openbite, Diastema and Mesiodens

Introduction

Malocclusion is an abnormal position of the jaw or teeth. Incorrect bite can cause tooth decay and risk of periodontitis. Malocclusion ranges in severity from low to high, reflecting biological differences across individuals (Kouda et al., 2020). Malocclusion is a condition that results in poor aesthetics because there is an imbalance between the surrounding muscles and the teeth, jaw, and skull. This imbalance does not ensure functional equilibrium (Haryati, Nurjanah, & Sayudin, 2023). Growth consists of periods of accelerated growth followed by periods of slower growth (Suutela et al., 2022). Individual identification of the pubertal growth spurt period is very important in orthodontic treatment (Hebert et al., 2019). The best growth changes are achieved during the pubertal growth spurt, when the different bones of the face grow at an optimal rate, thereby maximizing treatment results (Jeelani, Fida, & Shaikh, 2016).

The results of research at Jakarta Junior high Schools by FKG UI provide an illustration that the highest prevalence is mild to severe malocclusion (83.4%). The most common abnormalities were crowding (44.9%), gapped teeth (16.7%), buck teeth (6.3%), overbite (6.3%), crossbite (12.3%) and openbite (13.2%). There is no

difference in prevalence between men and women. The level of awareness of the need for treatment is high according to the severity of the malocclusion (Wijanarko, 1999).

In Indonesia, the prevalence of dental malocclusion in adolescents is still high, from 90% in 1983 to 89% in 2006, while adolescent dental health behavior, especially regarding dental health behavior, is still not good and dental care is not optimal. Psychological and social aspects generally influence the quality of life of teenagers. Children are the future and strength of a nation. They are a collection of healthy, protected, educated and well-developed child.

Research Method

This research used a retrospective descriptive observational study with a cross sectional design. Involving 7 class X high schools at the Gunung Samarinda Community Health Center, Balikpapan, East Kalimantan. The research was carried out with a total of respondents numbering 1339 students, 79 students who meet the inclusion criteria, namely children aged 15-16 years (pubertal growth spurt) who had recruited in August 2023 at the Gunung Samarinda Community Health Center, Balikpapan, East Kalimantan.

It was also categorizes gender into male and female, because there are different peak of pubertal growth spurt between boys and girls. Age was categorized based on groups according what kind malocclusion they had. The measurement method in this study used an intra-oral examination by looking at the condition of the teeth based on malocclusion criteria: protrusion, retrognathia, crowding, crossbite, deepbite and diastema. Version 22 of the SPSS statistical base program was used to examine all of the data. The case's clinical and demographic details were described using descriptive analysis. Proportions (%) were used to represent categorical data.

Result and Discussion

Research shows that out of 79 students who have been recruited during the networking between August 2023 at Gunung Samarinda Community Health Center, Balikpapan, East Kalimantan showed a level of severity malocclusion: 56 students with Crowding teeth (0,042%), 11 students with Protrusion (0,008%) 10 Diastema (0,007 %), 1 Mesiodens (0,00075 %) and 1 Crossbite case (0,00075 %) was found from about 1339 students who were get screening test at that time. These data were process using SPSS which we can see in these tables below:

Table 1. Distribution Based on Type of Malocclusion

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Crowding	56	70.9	70.9	70.9
	Protusif	11	13.9	13.9	84.8
	Diastema	10	12.7	12.7	97.5
	Mesioden	1	1.3	1.3	98.7
	Crossbite	1	1.3	1.3	100.0
Total		79	100.0	100.0	

Table 2. This table is explained about croostabulation between age and gender

Crosbulation For Age and Gender			Gender		Total
			Women	Men	
Age	14.00	Count	9	1	10
		% within age	90.0%	10.0%	100.0%
	15.00	Count	29	19	48
		% within age	60.4%	39.6%	100.0%
	16.00	Count	12	6	18
		% within age	66.7%	33.3%	100.0%
	17.00	Count	0	3	3
		% within age	0.0%	100.0%	100.0%
Total		Count	50	29	79
		% within age	63.3%	36.7%	100.0%

From the table above it is found that:10 students with aged 14 years, 9 were girls and 1 was a boy who had a malocclusion, 48 students with aged 15 years, 29 were girls and 19 were boys who had a malocclusion, 18 students with aged 16 years, 12 were girls and 6 were boys who had a malocclusion. There were only 3 boys aged 17 years who had malocclusion.

Discussion

The subjects in this study were students with age between 14 to 16 years old. This is the period where kids grow up fast in both boys and girls. The growth spurt age of girls is 2 years earlier than in boys. Boys completed their growth spurt at age 16 (Singh & Sharma, 2014). The results has shown us that the prevalence of malocclusion were high in female than male students so that it was breakdown the current research theory that said there was no different type of malocclusion during the growth spurt period between boys and girls.

Puberty begins at a different time for each individual and varies depending on factors like gender, generation, environment, and population. We hypothesize that these variables may have an impact on the timing of pubertal growth (Enikawati et al., 2018). Tooth number abnormalities, tooth shape anomalies, tooth size anomalies, and early excision of deciduous teeth are examples of local variables that have an impact. Congenital conditions, metabolic diseases, malnourishment, negative behaviors, the environment, and genetic variables are examples of general influences (Farani & MI, 2021);(Shrestha, Marla, Shrestha, & Maharjan, 2015).

Conclusion

In previous research it was said that there is no differences malocclusion between male and female, but in this study it occurred more often in female teenagers, whereas male teenagers were in their pubertal growth spurt.

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