

Malpositions of anterior teeth was conducted by using form investigation based on sex

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Abstract. Malpositioned anterior teeth can aesthetically influence, self-appearance, the function of mastication and speech. Malpositioned teeth refers to altered positioning of one or more teeth from a well-aligned jaw. In general, boy's jaw is bigger than girl's. This enable to makes difference risk of malpositioned anterior teeth between boy and girl. The aim of this study to find information about to detect risk difference malpositioned anterior teeth in student of SMPN 6 Yogyakarta based on sex. Research used observational with cross sectional. The subjects of study were entire student of class VII SMPN 6 Yogyakarta that fulfil criteria and got that is 211 students are 91 students of boy and 120 of girl students. The objects of this study are jaw of anterior teeth on and lower jaw. The evaluation malpositioned anterior teeth was conducted by using form investigation based on sex are boy and girl, evaluation appropriate criteria prevalence malpositioned anterior teeth which cover mesioversion, distoversion, buccoversion, palatoversion, linguoversion, labioversion, torsiversion, transversion and axiversion was scored 1, while normal position was scored 0. The results of the research were obtained by applying statistics method which used cross tabulation to obtain *Odds Ratio* (OR) and appropriate magnitude OR = 0.59, OR < 1 (Protective risk factor), that meaning boy sex will be protected to the happening malpositioned anterior teeth is compared boy sex. From the research, it can be concluded that risk malpositioned anterior teeth in girl student SMPN 6 Yogyakarta which was high than boy students.

1 Introduction

Tooth positioned affects the aesthetics, beliefs or the appearance of the body and the function of the teeth in chewing, swallowing and talking. The position of the teeth is in an individual varies greatly, which is determined by the size, shape, occlusion and harmonized space [1].

Malpositioned of teeth is an abnormal tooth position or incorrect tooth position caused by a pattern of habitual chewing, size and shape of teeth. Malpositioned teeth refers to altered positioning of one or more teeth from a well-aligned jaw [2]. The research by Lavelle and Foster conducted found that more than 65 % of the population had teeth that were larger than the size of the arch of the tooth, so that the teeth were located crowded or malpositioned [1].

Malpositioned of individual teeth includes: (1) mesioversion are the position of the teeth more mesial than normal; (2) distoversion, are the position of the teeth more distally than normal; (3) buccoversion, are the position of the teeth more buccal than normal; (4) palatoversion, are the position of the teeth more palatally than normal; (5) linguoversion, are the position of the teeth to be more lingual than normal; (6)

labioversion, are the position of the teeth more labial than normal; (7) torque, are the position of the rotating gear against the axle; (8) transversion, are the position of all the teeth moving with their axles and (9) axiversion, are the position of the teeth moving but the ends of the axles are fixed [3].

Malpositioned teeth refers to improper positioned teeth in the alveolar process of the maxillary or the mandibullary, with respect to other teeth as well as the overall positioning of the teeth in the jaw bone. The ideal positioned teeth is determined by the resting and functional positioned of the mandibullary although the situation can be reversed, but incorrect tooth position (malpositioned) can affect mandibullary function. The ideal position of the teeth is when: (a) the incisors are slit; (b) mesial anthropoid clefts of the upper and distal canines of the lower canines; (c) vertical incisors, lower incisors occlusion with the upper incisor singulum and (d) the distal surfaces of the upper and lower second molars are in the same vertical plane [1].

The percentage of malpositioned teeth function. Boy and girl e differences can be seen from the cranial bone and face [4]. 6th Junior High School of Yogyakarta consists of boy and girl students who have reached adolescence which is approximately 12 yr. Permanent

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teeth at 12 yr old to 13 yr old have grown perfectly, except for M₃ teeth. At the age of adolescence there are various changes to the hormonal system that affect bad habits in adolescence. 6th Junior High School of Yogyakarta does not have a School Dental Health Education (DHE) program and has no collaboration with the Puskesmas, so 6th Junior High School of Yogyakarta that it has limitations in knowledge regarding self-election especially dental and oral hygiene.

2 Materials and methods

Type of research is observational with cross sectional. The study population are 6th Junior High School of Yogyakarta's students with the inclusion criteria: a) Never and not undergoing orthodontic treatment. b) Being in the period of permanent teeth, whether the number is complete or not.

The sample size in the study was all VII grade students of 6th Junior High School of Yogyakarta, totalling 213, including 92 boy students and 121 girl students.

The method of sampling by the total sampling method, which is all samples from the population of class VII 6th Junior High School of Yogyakarta that are needed in the study are mouth glass to see the condition of the subject teeth and blank examination sheets to record the results of measuring the position status of the student teeth. Sexes, boy and girl, are assessed according to the criteria for malpositioned of the anteriors teeth which include mesioversion, distovertion, buccoverversion, palatoverversion, linguoverversion, labioversion, torsioversion, transversion and axioversion was scored 1, while normal position was scored 0.

Research preparation stage are the management of the letter is related to research, named preparing a letter of application for permission for research, then taking data on the identity of class VII students obtained from 6th Junior High School of Yogyakarta regarding the name, gender and number of students. Then, examination of research subjects. Next, examination of

the subject of the study begins by distributing the research form that contains the identity of the subject to class VII students of 6th Junior High School of Yogyakarta which consists of boy and girl students.

To collect the research form, then prepare the research tools and materials to carry out the examination according to the research subjects determined using the examination blank. Assessment of anterior teeth malpositioned was carried out based on sex, named boy and girl, obtained according to malpositioned criteria. Forms totaling 213 sheets have been distributed to 92 boy and 121 girl students, then examined according to the research criteria, which have never been and are not undergoing orthodontic treatment and are in a period of permanent teeth, both teeth are complete and incomplete and subjects are fulfilling.

Statistical analysis of the research were obtained by applying statistics method which used cross tabulation to obtain Odds Ratio (OR) and appropriate magnitude OR.

3 Results

Forms totaling 213 sheets have been distributed to 92 boy and 121 girl students, then examined according to the research criteria, which have never been and are not undergoing orthodontic treatment and are in a period of permanent teeth, both the number of teeth is complete or incomplete and subjects that meet Form-based criteria obtained 211 students, namely 91 boy students and 120 girl students.

3.1 Malposition of dental anterior element of upper jaw teeth in class VII 6th junior high school of Yogyakarta based on sex

The anterior tooth malpositioned status can be seen in Table 1. It shows from 211 seventh grade students of 6th Junior High School of Yogyakarta consisting of 91 (43.13 %) boy students and 120 (56.87 %) girl students.

Table 1. The frequency distribution malpositioned of the anteriors teeth in the maxillary tooth element class VII students of 6th Junior High School of Yogyakarta based on gender sex.

The Maxillary Tooth	Malpositioned Status	Sex				Total	
		Boys		Girls		n	%
		n	%	n	%		
11	LAV	6	3.77	8	5.03	14	8.81
	LV	0	0.00	1	0.63	1	0.63
	TV	3	1.89	1	0.63	4	2.52
	DV	1	0.63	1	0.63	2	1.26
	MV	0	0.00	0	0.00	0	0.00
12	LAV	1	0.63	2	1.26	3	1.89
	LV	9	5.66	15	9.43	24	15.09
	TV	0	0.00	1	0.63	1	0.63
	DV	0	0.00	2	1.26	2	1.26
	MV	0	0.00	0	0.00	0	0.00
13	LAV	2	1.26	4	2.52	6	3.77
	LV	1	0.63	3	1.89	4	2.52
	TV	4	2.52	8	5.03	12	7.55
	DV	3	1.89	7	4.40	10	6.29

The Maxillary Tooth	Malpositioned Status	Sex				Total	
		Boys		Girls			
		n	%	n	%	n	%
	MV	0	0.00	0	0.00	0	0.00
21	LAV	4	2.52	8	5.03	12	7.55
	LV	1	0.63	4	2.52	5	3.14
	TV	3	1.89	3	1.89	6	3.77
	DV	1	0.63	0	0.00	1	0.63
	MV	0	0.00	0	0.00	0	0.00
22	LAV	1	0.63	4	2.52	5	3.14
	LV	5	3.14	12	7.55	17	10.69
	TV	2	1.26	5	3.14	7	4.40
	DV	1	0.63	2	1.26	3	1.89
	MV	0	0.00	0	0.00	0	0.00
23	LAV	2	1.26	1	0.63	3	1.89
	LV	1	0.63	1	0.63	2	1.26
	TV	0	0.00	2	1.26	2	1.26
	DV	2	1.26	4	2.52	6	3.77
	MV	3	1.89	4	2.52	7	4.40
Total		56	35.22	103	64.78	159	100.00

Based on the anterior tooth malpositioned status in the maxillary tooth element, in boy sex the malpositioned anterior teeth with 56 teeth (35.22 %) included Insisivus 1 are high labioversi (LAV) 6 tooth (3.77 %), Insisivus 2 are high linguoversion (LV) 9 teeth (5.66 %). Canine (tooth 13) high of torsiversion (TV) are 4 teeth (2.52 %), Insisivus 1 (tooth 21) high labiovertion (LAV) are 4 tooth (2.52 %), Insisivus 2 (tooth 22) high of linguoversion (LV) 5 teeth (3.14 %), Canine (tooth 23) high of mesioversion (MV) are 3 (1.89 %). Whereas in girl the anterior teeth malpositioned in the maxillary tooth element is 103 teeth (64.78 %) included Insisivus 1 are high labioversi (LAV) 8 tooth (5.03 %), Insisivus 2 are high linguoversion (LV) 15 tooth (9.43 %). Canine (tooth 8) high of torsiversion (TV) are 4 tooth (2.52 %), Insisivus 1 (21) high

labiovertion (LAV) are 4 tooth (5.03 %), Insisivus 2 (tooth 22) high of linguoversion (LV) 12 teeth (7.55 %), Canine (tooth 23) high of distoversion (DV) and mesioversion (MV) are 4 (2.52 %).

3.2 Malpositioned anterior teeth element of lower jaw teeth in class VII 6th junior high school of Yogyakarta based on sex

The anterior tooth malpositioned status can be seen in Table 2. It shows from 211 seventh grade students of 6th Junior High School of Yogyakarta consisting of 91 (43.13 %) boy students and 120 (56.87 %) girl students.

Table 2. The frequency distribution malpositioned anteriors teeth in mandibullary tooth class VII students of 6th Junior High School of Yogyakarta based on sex.

Mandibullary Tooth	Malpositioned Status	Sex				Total	
		Boy		Girls			
		n	%	n	%	n	%
31	LAV	5	2.78	6	3.33	11	6.11
	LV	3	1.67	5	2.78	8	4.44
	TV	0	0.00	1	0.56	1	0.56
	DV	0	0.00	0	0.00	0	0.00
	MV	0	0.00	2	1.11	2	1.11
32	LAV	2	1.11	4	2.22	6	3.33
	LV	6	3.33	11	6.11	17	9.44
	TV	3	1.67	1	0.56	4	2.22
	DV	0	0.00	2	1.11	2	1.11
	MV	0	0.00	1	0.56	1	0.56
33	LAV	1	0.56	7	3.89	8	4.44
	LV	1	0.56	4	2.22	5	2.78
	TV	7	3.89	10	5.56	17	9.44
	DV	1	0.56	3	1.67	4	2.22
	MV	1	0.56	0	0.00	1	0.56
41	LAV	6	3.33	3	1.67	9	5.00
	LV	2	1.11	5	2.78	7	3.89
	TV	0	0.00	2	1.11	2	1.11
	DV	0	0.00	0	0.00	0	0.00
	MV	0	0.00	0	0.00	0	0.00
42	LAV	3	1.67	3	1.67	6	3.33
	LV	5	2.78	18	10.00	23	12.78

Mandibularry Tooth	Malpositioned Status	Sex				Total	
		Boy		Girls			
		n	%	n	%	n	%
	TV	3	1.67	3	1.67	6	3.33
	DV	0	0.00	2	1.11	2	1.11
	MV	0	0.00	0	0.00	0	0.00
43	LAV	1	0.56	5	2.78	6	3.33
	LV	0	0.00	2	1.11	2	1.11
	TV	12	6.67	13	7.22	25	13.89
	DV	2	1.11	1	0.56	3	1.67
	MV	0	0.00	2	1.11	2	1.11
Total		64	35.56	116	64.4	180	100.00

Based on the anterior tooth malpositioned status in the mandibularry tooth element, in male sex the malpositioned of anterior teeth with 64 teeth (35.56 %) included Insisivus 1 (31) are high labioversi (LAV) 5 teeth (2.78 %), Insisivus 2 (tooth 32) are high linguoversion (LV) 6 teeth (3.33 %). Canine (tooth 33) high of torsiversion (TV) are 7 tooth (3.89 %), Insisivus 1 (41) high labiovertion (LAV) are 6 teeth (3.33 %), Insisivus 2 (tooth 42) high of linguoversion (LV) tooth 5 (2.78 %), Canine (tooth 43) high of torsioversion (TV) are 12 (6.67 %). Whereas in girl the malpositioned anterior teeth in the mandibularry tooth element is 116 tooth (64.44 %) included Insisivus 1 (tooth 31) are high labioversi (LAV) 6 tooth (3.33 %), Insisivus 2 (tooth 32) are high linguoversion (LV) 11 tooth (6.11 %). Canine (tooth 33) high of torsiversion (TV) are 10 tooth (5.56 %), Insisivus 1 (tooth 41) high linguovertion (LV) are 5 tooth (2.78 %), Insisivus 2 (tooth 42) high of linguoversion (LV) 18 tooth (10.00 %), Canine (tooth 43) high of torsiversion (TV) are 13 (7.22 %).

3.3 Malpositioned anteriors element in class VII 6th junior high school of Yogyakarta based on sex

Table 3. The frequency distribution malpositioned anterior teeth element class VII students of 6th Junior High School of Yogyakarta based on gender sex.

Malpositioned Anterior teeth	Sex				Sex	
	Boy		Girl		n	%
	n	%	N	%		
LAV	34	10.03	55	16.22	89	26.25
LV	34	10.03	81	23.89	115	33.92
TV	37	10.91	50	14.78	87	25.66
DV	11	3.24	24	7.08	35	10.32
MV	4	1.18	9	2.65	13	3.83
Total	120	35.40	219	64.60	339	100.00

Table 3 shows from 211 eventh grade students of 6th Junior High School of Yogyakarta consisting of 91 (43.13 %) boy students and 120 (56.87 %) girl students. Based on the anterior tooth malpositioned status, in boy sex the malpositioned anteriors teeth with 120 teeth (35.40 %) included labioversion (LAV) 34 teeth (10.03 %), linguoversion (LV) 34 teeth (10.03 %), torsiversion (TV) 37 teeth (10.91 %), distoversion (DV) 11 teeth (3.24 %), mesioversion (MV) 4 tooth (1.18 %), whereas in girl malpositioned anterior teeth is 219 tooth (64.60 %) including labioversi (LAV) 55 tooth (16.22 %), linguoversion (LV) 81 teeth (23.89 %) torsiversion (TV) 50 teeth (14.75 %),

distoversion 24 tooth (7.08 %), mesioversion (MV) 9 tooth (2.65 %).

3.4 Malpositioned anteriors teeth and normal positioned anteriors teeth in class VII 6th junior high school of Yogyakarta based on sex

Malpositioned anteriors teeth status and normal positioned is obtained as follows:

Table 4. The frequency distribution malpositioned anteriors teeth and normal positioned class VII students of 6th Junior High School of Yogyakarta based on gender sex.

Status of Anterior Teeth	Sex				Total	
	Male		Female			
	n	%	n	%	n	%
Malpositioned	51	24.17	82	38.86	133	63.03
Normal Positioned	40	18.96	38	18.01	78	36.97
Total	91	43.13	120	56.87	211	100.00

Table 4 shows from 211 eventh grade students of 6th Junior High School of Yogyakarta consisting of 91 (43.13 %) boy students and 120 (56.87 %) female students. Based on the tooth positioned status, in boy sex the malpositioned anteriors teeth 51 (24.17 %) and normal positioned are 40 (18.96 %), whereas in girl malpositioned anteriors teeth is 82 tooth (38.86 %) and normal positioned is 38 (18.01 %).

Table 4 shows the malpositioned anteriors teeth in female very high from boy and normal positioned more experienced not different boy and girl. The results of the research from 211 eventh grade students of 6th Junior High School of Yogyakarta consisting of 91 (43.13 %) boy students and 120 (56.87 %) female students. were obtained by applying statistics method which used cross tabulation to obtain Odds Ratio (OR) and appropriate magnitude :

$$Odds\ Ration\ (OR) = \frac{AD}{BC} = \frac{51 \times 38}{40 \times 82} = \frac{1938}{3280} = 0.59\ (1)$$

OR < 1 → Protective risk factor that meaning boy sex will be protected to the happening malpositioned anteriors teeth is compared boy sex.

4 Discussions

Table 1 shows the malpositioned anterior teeth in the maxillary tooth element of 211 class VII students of 6th Junior High School of Yogyakarta based on sex, the upper jaw tooth element had more linguoversion (LV) was incisor 2 (tooth 12), in girl the number was greater 15 teeth. (9.43 %) than men with 9 teeth (5.66 %). Overall the malpositioned status anterior teeth in the maxillary element based on sex, the number was greater in girl, namely 103 tooth (64.78 %), whereas in boy s it was 56 tooth (35.22 %).

Table 2 shows the malpositioned anterior teeth in the mandibullary tooth element of 211 class VII students of 6th Junior High School of Yogyakarta based on sex, the upper jaw tooth element in boy had more torsiversion (TV) was incisor 12 (6.67), than in girl the number was greater 12 tooth. (6.67 %). Overall, the malpositioned status anterior teeth in the mandibular element based on sex, the number was greater in girl, namely 116 teeth (64.44 %), whereas in boy s it was 64 tooth (35.56 %).

Table 3 shows the malpositioned anterior teeth from 211 class VII students of 6th Junior High School of Yogyakarta based on sex, in men more experienced torsiversion (TV) that is 37 teeth (10.91 %) whereas in girl more experienced linguoversion (LV) 81 tooth (23.89 %). Overall, the malpositioned status anterior teeth by sex, malpositioned anterior teeth was greater in girl, 219 tooth (64.60 %), whereas in boy s it was 120 tooth (35.40 %).

Malpositioned anterior teeth students of 6th Junior High School of Yogyakarta includes labioversion, linguoversion, torsiversion, distoversion and mesiovertion. Anterior teeth can be inside labiovertion or linguoversion or torsivertion positioned. Insisivus teeth can be torsivertion, mesioversion and distovertion. Canine teeth positioned can be labiovertion and mesioversion positioned. In the maxillary tooth element, which experienced more linguoversion, the number of 12 tooth and the female was greater than the boy, while in the lower jaw tooth element the woman experienced more linguoversion, it's the 2nd incisor while the boy experienced more torsiversion.

All types of malpositioned teeth, such as diastemas, crowding, rotated teeth, may result in early tooth loss due to the formation of periodontal pockets on the mesial surface of the tooth involved, because the bone crest tends to follow the cemento-enamel junction [1]. These conditions can be caused by early or delayed eruption of teeth, impaction of a tooth, early or delayed growth of the upper or lower jaw, early loss of a tooth or teeth without placement and parafunctional habits such as thumb sucking or tongue thrusting [4]. Abnormal tooth size affects the alignment of the teeth in the arch so that tooth size is closely related to tooth malpositioned [5].

The anterior teeth can be in the labioversion or linguoversion or torsionversion positions. The incisors can be in a positions of torsionversion, mesioversion and distoversion. Canines can be in the mesioversion and labioversion positions. If all the crowns and roots of the teeth are malpositioned, then the inclination is declared displaced [6].

The mesiodistal size of the maxillary deciduous teeth in boys is not necessarily bigger than girls, this is due to diet and heredity, but in Table 4 shows the malpositioned anterior teeth in female very high from boy, and normal positioned more experienced not different female and boy. Malpositioned status is greater for girl than for men. These results are in accordance with the results of calculations with the frequency distribution of cross tabulation which shows girl are higher than boy. Malposition of teeth is caused by functional stress of the chewing muscles. Food consumption between men and girl is the same, the difference is the volume [3].

The results of statistical calculations using Odds Ratio show that boy sex will be protected (as a protective factor) for the occurrence of malpositioned anterior teeth compared to female sex. This means that the risk malpositioned anterior teeth in girl is higher than that of boy. Jaws in men are generally larger while in girl in general they are smaller. Teeth in men are usually larger than those of girl. Cranial bones in men are larger than girl, for example the mandibullary or lower jaw in boy is wider, bigger, taller, stronger and rougher whereas in girl it is smaller and smoother [8]. The growth of girls two year to adulthood faster than boys, but boys grow bigger than girls [9].

The upper lip in men is more advanced and thicker than the upper lip in girl [10], meanwhile, the upper and lower lip in girls are more advanced and prominent than the upper and lower lips in boys [11]. The increase in the size of the parts of the upper and lower jaw, where the teeth before and after the eruption did not always run evenly. An increase in the width of the dental arch in both children boy s and girl [12].

The pattern of increment and measurement of standard values should be used as a comparison in evaluating individual growth rates [13]. The roots of the deciduous teeth are not properly and timely absorbed, the eruption of the permanent teeth will be disturbed and will change position, causing malpositioned [14].

Malpositioned teeth is also caused by the functional pressure of the chewing muscle. The food consumption between men and girl is the same, the difference is the volume [3]. Men in terms of eating more than girl, as a result the boy jaw is more trained. Frequently trained jaws can help inhabit the development malpositioned teeth. this allows a higher risk of malpositioned anterior teeth of girl than boy.

The shape and size of the dental play an important role in determining the space available for the teeth. The suboptimal growth of the jaw causes the teeth to grow thickly due to the imbalance between the size of jaw and teeth [1]. From observations show that it is located 6th Junior High School of Yogyakarta in urban areas so that the food consumption of students is influenced by modern cariogenic foods and drinks.

A cariogenic diet affects the occurrence of dental diseases in children such as dental caries. Food-related factors involve the release of the sugar are the frequency of cariogenic consumption, the drinking and chewing habits, the presence of cariogenic dental caries [15]. Dental caries can result in gangrenous children's teeth and prematurely dated teeth. Gangren teeth or premature

dates (primary teeth) cause the growth of permanent teeth to be disrupted and not maximal so that the jaw becomes narrow.

The narrow jaw with large size teeth causes disharmony between the growth of the arch width of the jaw and the location of the teeth resulting in malpositioned teeth [1]. Malposition teeth can result in trauma to the tooth to soft tissue and poor personal appearance or disruption of normal speech [1]. A regular pattern of dentofacial changes that accompanies growth and development [16].

5 Conclusion

This research showed that risk malpositioned anterior teeth in girl student SMPN 6 Yogyakarta higher than boy students.

The input and discussions with drg. Erwan Sugiatno, MS., Sp. Pros (K), Ph. D and DR. drg. Sri Widiati, MPH, University Of Gadjah Mada of Dentistry, is gratefully acknowledged. The author declare that they have no conflicts of interest.

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