

## Bullying in schoolchildren according to Angle's classifications of malocclusion.

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**Abstract:** Objective: To compare bullying in schoolchildren according different types of Angle's malocclusion. Materials and methods: A cross-sectional and prospective study was performed. 217 schoolchildren were evaluated. A scale-adapted validated questionnaire was applied to measure general bullying. Malocclusion was classified according to Angle's classification. Comparison in bullying between different types of malocclusions was performed by Kruskal Wallis non-parametric test. Multiple linear regression analysis was also performed. Results: No statistically significant differences in bullying between the different types of Angle's malocclusion was found ( $p=0.295$ ). Multiple linear regression applied to bullying scores treated as dependent variable with malocclusion, sex, and age showed no influence of these variables on bullying ( $R_2=0.0027$ ,  $p>0.05$ ). Conclusion: Bullying in schoolchildren does not differ according Angle's classification of malocclusion. Further studies are necessary to emphasize the assessment of bullying related to malocclusion of anterior teeth.

*Keywords:* bullying; child; schools; malocclusion.

### INTRODUCTION.

Bullying has become a global problem for children and teenagers. Bullying varies as a result of differences in age of participants throughout the school years, according to local cultures, and time periods.<sup>1</sup> The implications of bullying are far-reaching, and links between bullying and depression, low self-esteem, physical health, low academic performance and crime has been made.<sup>2</sup> There may be various forms of bullying, such as name calling, harassment or threat, physical acts, discrimination, theft, harassment via internet (*cyberbullying*), among others.<sup>3</sup>

Remarks about teeth have also been associated to bullying.<sup>3</sup> Nevertheless, the impact of dental characteristics on bullying had been scarcely evaluated, specially malocclusions. Malocclusion negatively affects the masticatory system and is characterized by changes in the positions of the teeth. Angle's classification is a worldwide accepted way of classifying malocclusions considering the anteroposterior features of teeth based mainly on the relationship with the molar. This classification categorizes malocclusions into three groups: Class I, Class II (subdivisions 1 and 2) and Class III.<sup>4</sup>

In addition there is strong evidence that bullying victimization

in schools is causative of mental illness.<sup>2</sup> Previous studies<sup>5</sup> have assessed esthetic dental anomalies as a motive for bullying in schoolchildren. Other studies<sup>6,7</sup> have reported on certain aspects of malocclusion on bullying, but it is not clear if a particular class of malocclusion, according to Angle's classification, is more strongly related to bullying; this could help to complement a diagnosis in relation to the psychosocial life of schoolchildren.

The objective of this investigation was to compare bullying in schoolchildren with different types of Angle's malocclusion and, in addition, analyze the influence of malocclusion, sex, and age on bullying.

## MATERIALS AND METHODS.

Ethics and study protocol were approved by the Stomatology Permanent Research Committee of the Antenor Orrego Private University, Trujillo-Peru (Code number: 09682015FMEHUUPAO). All individuals signed an informed consent before participating in the study.

### Study Sample

A prospective and cross-sectional study was conducted on 217 schoolchildren between 10 to 17 years old (13.40 $\pm$ 1.58), 106 females (13.33 $\pm$ 1.64) and 111 males (13.46 $\pm$ 1.54), 150 from a public school and 67 from a private one. To determine sample size, data from a pilot study with 15 schoolchildren was used. A statistical power of 80% and a confidence level of 95% were considered. Therefore, a minimum of 15 individuals per malocclusion was needed, thus groups with each type of malocclusion were formed:

78 children with class I malocclusion, 18 with class II-1, 25 with class II-2, 76 class III and 20 with normal occlusion (control group). Participants met the inclusion criteria: complete permanent dentition up to 1<sup>st</sup> molars, acceptance to participate in the study, and whose guardian or trustee allowed their participation. Exclusion criteria were: previous orthodontic, orthopedic or orthognathic treatment, use of prosthetic attachments or previous buccal surgery.

### Bullying measurement

A questionnaire adapted from a previously validated one<sup>8</sup> was applied to measure bullying. Each item had a rating from 1 to 5 (1=this has not happened to me in

the last two months, 2=this has only happened once or twice in the last two months, 3=this has happened 2 or 3 times a month, 4=this has happened once a week, 5=this has happened several times a week) and the total numerical score of bullying was considered (Table 1) in order to make posterior comparisons by malocclusion. The Cronbach's alpha of the questionnaire was 0.77 for the total sample.

### Determination of the malocclusion

To determine the type of malocclusion, plaster casts were obtained and coded for later analysis. Malocclusions were evaluated according to Angle's classification and catalogued as class I, II-1, II-2 and III.<sup>4</sup> A group with normal occlusion was included as a control.

### Method Error

The researcher was calibrated in determining the type of malocclusion by evaluating 15 dental casts. To determine the concordance of the inter-evaluator and intra-evaluator measurements (second observation after 2 weeks), Cohen's Kappa test was used. The concordances were found to be substantial for intraevaluator measurements (0.84,  $p<0.05$ ) and almost perfect for inter-evaluator measurements (0.92,  $p<0.05$ ).

### Statistical analysis

Data was processed in the statistical program Stata version 12. (Stata Corp. Texas, USA). Descriptive statistics were calculated and presented for each type of malocclusion. The comparison of bullying between groups was performed using the Kruskal Wallis nonparametric test. A multiple linear regression analysis was also performed. Significance was considered at 5%.

## RESULTS.

There was no statistically significant difference between bullying scores in the different types of malocclusion for the whole sample for either sex ( $p>0.05$ ).

The mean of bullying scores in the patients with class I malocclusion was 16.99, with class II-1 was 16.11, with class II-2 was 15.12, in class III was 16.86, and in those with normal occlusion was 18.15 (Table 2).

Multiple linear regression applied to bullying scores (treated as dependent variable with continuous values) with malocclusion, sex, and age shown no interaction influence on bullying ( $R_2=0.0027$ ,  $p>0.05$ ).

**Table 1.** Items of the questionnaire and bullying scores for the whole sample (n=217).

Item	Mean	SD	Min.	Max.
I have been bullied at my school in the last two months.	1.49	1.03	1	5
I have been called offensive names, made fun of, bothered in a way that hurt.	1.92	1.30	1	5
Other students deliberately left me without things, have excluded me from their group of friends, or have completely ignored me.	1.29	0.77	1	5
I was hit, kicked, pushed or locked.	1.11	0.49	1	5
Other students told lies or spread false rumors about me and tried to make others dislike me.	1.63	1.02	1	5
I had money or other things taken from me or damaged.	1.33	0.78	1	4
I was threatened or forced to do things that I did not want.	1.18	0.61	1	5
I was bullied with offensive name-calling or by comments about my race or skin color.	1.45	1.02	1	5
I was bullied with offensive name-calling, comments or gestures with a sexual connotation.	1.18	0.63	1	5
I was bullied due to the appearance of my teeth.	1.29	0.72	1	5
I was bullied with media, hurtful messages, calls or images or in other ways on my mobile phone or through the Internet (computer). (Please remember that it is not intimidating when done in a friendly and playful manner).	1.24	0.77	1	5
I was bullied on my mobile phone or through the Internet.	1.69	0.88	1	5
I was bullied in another way.	1.18	0.65	1	5
<b>Total</b>	<b>17.00</b>	<b>5.66</b>	<b>13</b>	<b>46</b>

SD: standard deviation. **Min:** minimum value. **Max:** maximum value.

**Table 2.** Comparison of bullying scores in schoolchildren with different types of Angle's malocclusion by the whole sample and according to sex (n=217).

Sample	Malocclusion	n	Mean	SD	Min.	Max.	95% Confidence Interval	Median	Iqr	p-value*		
Total sample	Class I	78	17.3	6.4	13	46	15.8 - 18.7	15.0	5.0	0.295		
	Class II-1	18	16.7	4.9	13	30	14.2 - 19.1	15.5	8.0			
	Class II-2	25	14.9	2.9	13	23	13.7 - 16.1	14.0	4.0			
	Class III	76	17.2	5.9	13	38	15.9 - 18.6	15.5	7.0			
	Normo-occlusion	20	18.0	4.6	13	27	15.8 - 20.2	17.5	8.0			
	<b>Total</b>	<b>217</b>	<b>17.0</b>	<b>5.7</b>	<b>13</b>	<b>46</b>	<b>16.2</b>	<b>17.8</b>	<b>15.0</b>	<b>6.0</b>		
Sex	Female	Class I	42	17.4	6.5	13	46	15.3 - 19.4	16.0	5.0	0.400	
		Class II-1	6	14.0	2.3	13	17	11.6 - 16.4	13.5	4.0		
		Class II-2	10	15.0	3.5	13	23	12.5 - 17.5	14.0	5.0		
		Class III	38	16.6	0.7	13	30	15.1 - 18.0	16.0	6.0		
		Normo-occlusion	10	17.8	1.7	13	27	13.9 - 21.7	16.0	9.0		
		<b>Total</b>	<b>106</b>	<b>16.7</b>	<b>5.3</b>	<b>13</b>	<b>46</b>	<b>15.7</b>	<b>17.7</b>	<b>15.5</b>	<b>5.0</b>	
	Male	Class I	36	17.7	1.1	13	37	15.5 - 19.9	14.5	5.5	0.406	
		Class II-1	12	15.6	1.0	13	30	13.4 - 17.8	18.5	7.5		
		Class II-2	15	15.5	1.0	13	19	13.4 - 17.7	14.0	4.0		
		Class III	38	16.4	0.8	13	38	14.8 - 18.1	15.0	8.0		
Normo-occlusion		10	18.1	1.8	13	23	14.0 - 22.2	18.5	5.0			
	<b>Total</b>	<b>111</b>	<b>17.3</b>	<b>6.0</b>	<b>13</b>	<b>38</b>	<b>16.2</b>	<b>18.4</b>	<b>15.0</b>	<b>7.0</b>		

\*Kruskal Wallis was used. SD: standard deviation. **Min:** minimum value. **Max:** maximum value. Iqr: Interquartile range.

## DISCUSSION.

Bullying can cause problems in the physical, emotional and social health of victims, sometimes resulting in the need for medical assistance, or in extreme cases, severe aggressions may lead to depression or even death.<sup>2</sup> Previous studies<sup>9</sup> have shown that some psychological aspects may vary according to Angle's malocclusion. Nevertheless, the findings of the present study showed that there was no significant difference between the scores of bullying in the different types of malocclusion, and a significant influence of sex or age was not found either.

The absence of differences may be because the occlusal disturbances in an anteroposterior direction do not significantly affect the social life of students. Another possible explanation is that the dentofacial features of the anterior teeth could more strongly contribute to bullying, as was reported by Seehra *et al.*<sup>10</sup> Similarly, Al-Bitar *et al.*,<sup>7</sup> reported that the presence of spaces between teeth, missing teeth, alteration of shape or color of teeth and prominent upper front teeth were associated to bullying.

Another possible explanation may be the existence of other factors, not necessarily related to the dental features, such as: health condition, school culture environment, mental health problems, use of drugs or alcohol, relationship problems with parents, difficulty in making friends, broken families, physical punishment, violent parents, victimization among siblings, and

parents with a history of harassment.

A possible limitation was the use of a questionnaire to evaluate general bullying, since no specific questionnaire to evaluate bullying according teeth has been reported.

Although the questionnaire is based on a validated one, and also contained an item regarding the appearance of teeth, we believe that a bullying questionnaire, focus on aesthetic problems or dental problems, is needed to fill this gap.

In addition, further studies need to be conducted to assess bullying in relation to other methods in measuring malocclusion, particularly of the anterior region of the mouth. Finally, it's important for schoolchildren to be considered as a psychosocial individual by orthodontists, because this will lead to the improvement of traits that are visible daily in social face-to-face interactions.

## CONCLUSION.

There were no significant differences in bullying between the different types of Angle's malocclusion in the entire sample, neither according to sex. It is possible that there are certain limitations for connecting the actual diagnosis methods of malocclusions with psychosocial aspects such as bullying.

Further studies to emphasize the assessment of bullying in relation to malocclusion of the anterior teeth, and also for the development of a bullying questionnaire focusing on aesthetic or dental problems are necessary.

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