J Oral Res
oral and craniofacial sciences

Communication

Crowding of anterior teeth and bullying in schoolchildren.

Apiñamiento de dientes anteriores y bullying en escolares.

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Receipt : 30/11/2018 Revised: 02/01/2019
Acceptance: 08/25/2020

Abstract: **Objective:** To compare the crowding of anterior teeth in schoolchildren with and without experience of bullying. **Materials and Methods:** A prospective, cross-sectional, comparative and observational study was conducted in two educational institutions, one public and one private; The sample consisted of 218 schoolchildren between 11 and 16 years of age. Dental crowding was evaluated in the upper and lower anterior sector using Little's irregularity index. To diagnose bullying, a previously validated questionnaire was applied, with dichotomized questions. The comparison between crowding in patients with and without experience of bullying was evaluated with the U-Mann Whitney statistical test. **Results:** Statistically significant differences in the amount of crowding (p<0.05) were found. The average crowding for the group subjected to bullying was 11.6 +/- 9.4 mm and in the group without bullying was 9.1+/- 7.9 mm. **Conclusion:** There was a higher amount of dental crowding in schoolchildren subjected to bullying compared to schoolchildren with no bullying.

Keywords: *Malocclusion; child; adolescent; bullying; tooth; cross-sectional studies.*

Resumen: **Objetivo:** Comparar el apiñamiento de dientes anteriores en escolares con y sin experiencia de acoso escolar (bullying). **Material y Métodos:** Se realizó un estudio prospectivo, transversal, comparativo y observacional en dos instituciones educativas, una pública y otra privada; La muestra estuvo conformada por en 218 escolares entre 11 y 16 años de edad. El apiñamiento dental se evaluó en el sector anterior superior e inferior utilizando el índice de irregularidad de Little. Para diagnosticar acoso escolar, se aplicó un cuestionario validado previamente, con preguntas dicotomizadas. La comparación entre el apiñamiento en pacientes con y sin experiencia de acoso escolar se evaluó con la prueba estadística U-Mann Whitney. **Resultados:** Se encontraron diferencias estadísticamente significativas la cantidad de apiñamiento (p<0.05). El apiñamiento promedio para el grupo sometido a acoso escolar fue de 11.6 +/- 9.4 mm y en el grupo sin acoso escolar fue de 9.1 +/- 7.9 mm. **Conclusion:** Hubo un mayor grado de apiñamiento dental en los escolares sometidos al acoso escolar en comparación con los escolares sin acoso escolar.

Palabra Clave: *Maloclusión; niño; adolescente; acoso escolar; diente; estudios transversales.*

Cite as:
Rivera-Montoya I, Saldaña-Carranza V & Carruitero MJ.
Crowding of anterior teeth and bullying in schoolchildren.
J Oral Res 2020; 9(3):162-165.
Doi:10.17126/joralres.2020.031

ISSN Print 0719-2460 - ISSN Online 0719-2479. www.joralres.com/2020

INTRODUCTION.

Bullying is currently known as aggressive behavior or intentional harm carried out repeatedly in a relationship.[1] It can be direct intimidation, such as physical aggression, or indirect bullying, such as verbal aggression.[2] Comments about teeth have also been associated with intimidation, and the impact of dental characteristics on bullying has been reported.[3,4] Also, in adolescents with malocclusion awaiting orthodontic treatment, the prevalence of teasing related to dental appearance has been reported as 15%.[5]

The school is an institution responsible for the socialization of its students and provides positive elements for their integral formation, banning all types of abuse or harassment, strengthening respect, tolerance and assertiveness.[6] However, some psychosocial conditions such as bullying could still be present in school, whether private or public.[7]

Chikaodi *et al.*,[2] studied bullying and the contribution of physical and dentofacial characteristics among Nigerian adolescents, finding that there was more intimidation in public schools than in private schools (p= 0.003); However, the degree of bullying specifically due to dental crowding was not reported.

Bazán-Serrano *et al.*,[3] reported that bullying due to the features of teeth was more frequent in a public educational institution (22.22%) than in a private one (10.77%), highlighting the need to assess if this effect is related to crowding of the anterior teeth.

Al-Bitar *et al.*,[1] evaluated bullying in Jordanian schoolchildren and the contribution of general physical and dentofacial characteristics, finding that prevalence of dental crowding in schoolchildren subjected to bullying was 7.6%, but there were no findings that reported whether dental crowding in the anterior teeth can be among the most important dentofacial characteristics that contribute to bullying.

Furthermore, no studies have reported whether crowding directly influences the presence of bullying. Thus, the purpose of this study was to compare the crowding of anterior teeth in schoolchildren with and without experience of bullying.

MATERIALS AND METHODS.

The present study presented a transversal design and was carried out in two educational institutions of the city of Trujillo-Peru, one public (DH) and one private (MB), during the first academic period of 2018, with a total sample of 218 schoolchildren, from 11 to 16 years of age. To determine the sample size, data from a pilot study were used in a formula for comparison of averages, considering a confidence level of 95% and a statistical power of 51%, variances of 14.8 and 71.2 and a difference of means of 2.4mm of crowding, obtaining a minimum size of 41 schoolchildren per group.

The sample selection method was non-probabilistic, by convenience. The inclusion criteria were: schoolchildren from the first to fifth grade of studies with regular attendance, whose tutor or agent allowed their participation in the study, with all permanent teeth present, and with all anterior teeth without fractures.

The exclusion criteria were: Schoolchild with a systemic or psychological diagnosis and who uses or has used orthodontic or orthopedic appliances. The research was approved by the Permanent Committee of Scientific Research of the School of Stomatology of the Antenor Orrego Private University, Code N°: 13622017FMEHUUPAO.

In each classroom an informed consent form was distributed to request the participation of the students in the study, and sent home for consultation and signing by the parents. The minors signed an informed assent.

To diagnose bullying due to the features of teeth, a validated questionnaire was used, based on a previous study that evaluated both general bullying and esthetic characteristics of teeth reported by Bazán-Serrano *et al.*[3]

The following question was posed: "Were you intimidated at your school by the looks of your teeth?". The student had the following options:

(1) "I have not been intimidated in the last two months",

(2) "I have been bullied only once or twice in the last two months",

(3) "I have been bullied 2 or 3 times a month",

(4) "I have been bullied once a week," and

(5) "I have been bullied several times a week". It was considered as bullying related to teeth when the student selected options 3, 4 or 5, and as absence of bullying when selecting options 1 or 2.

Dental crowding was evaluated in the anterior and lower sectors using Little's irregularity index.[8] This quantitative method consisted of direct measurement with a digital caliper (calibrated to at least tenths of a millimeter), measuring the displacement linear of the adjacent anatomical contact points of the incisors (from mesial of canines), parallel to the occlusal plane,

the sum of the five measurements represented the value of the index of irregularity of the case, which was considered as anterior crowding. It was quantified for the maxilla, inferior, and for the total (sum of the first two).

Method Error

The content of the questionnaire was prepared based on a previously validated questionnaire.[3]

Likewise, its reliability was assessed with dichotomized questions (yes/no) by means of a pilot study with 60 schoolchildren, using formula of Kuder Richardson.

To evaluate the reliability of the irregularity index, 25 study models with a minimum waiting period of one week were measured at two different times.

To determine the reliability of the measurements, the intraclass correlation coefficient was used.

Statistical analysis

The processing of the information was supported by the statistical program Stata version 14 (StataCorp, Texas, USA). Descriptive statistics were calculated: mean, standard deviation, median, and 95% confidence interval.

The crowding values did not follow a normal distribution, after the application of the Shapiro-Wilk test, so the U Mann Whitney test was used for the comparisons. A level of significance of 5% was considered (p<0.05).

Table 1. Comparison of crowding of anterior teeth in schoolchildren with and without experience of bullying.

Bullying experience	n	Crowding Mean (mm)	SD	Crowding Median (mm)	95% confidence interval		Min	Max	p*
Without	177	9.1	7.9	7.0	8.0	10.3	0	40	0.045
With	41	11.6	9.4	10.0	8.6	14.5	0	37	

*: U Mann Whitney. **SD:**Standard Deviation. **Min:** Minimum value. **Max:** Maximum value.

RESULTS.

The instrument showed good reliability (KR-20= 0.707). When evaluating the error of the method for the irregularity index, high intraevaluation agreement was found, with intraclass correlation coefficients greater than 0.990 (p<0.001).

A total of 218 schoolchildren from one public (n=153) and one private (n=65) educational institutions were evaluated (13.41±1.44 years, range: 11-16 years), 109 females (13.37±1.51 years) and 109 males (13.46±1.38 years), of whom 177 were bullied (13.43±1.41 years) and 41 were not (13.32±1.62 years).

When comparing both groups, statistically significant differences in the amount of crowding (p<0.05) were found. The average crowding for the group experiencing bullying was 11.6+/-9.4 mm and in the group without bullying was 9.1+/-7.9 mm (Table 1).

DISCUSSION.

Bullying is currently a major problem for society, since it has been increasing with extremely significantly in recent years both in state and private educational institutions.[1-3,6,7]

In the present study, dental crowding was compared between a group of schoolchildren subjected to bullying and another without bullying, with greater crowding found in the group experiencing bullying compared to the group without bullying.

The results indicate that the presence of dental crowding could be a condition predisposing bullying to occur in schoolchildren.

Al-Bitar *et al.*,[1] evaluated bullying in Jordanian schoolchildren and its contribution in general and regarding dentofacial physical characteristics, finding that dental crowding in schoolchildren subjected to bullying was 7.6%. As such, the presence of bullying in schoolchildren becomes important because of its repercussion in their academics, since dental malocclusion can have an impact on students' self-esteem[9] therefore could affect their performance in school activities.

In the present study the evaluation has focused on

ISSN Print 0719-2460 - ISSN Online 0719-2479. www.joralres.com/2020

the presence of bullying due to the appearance of teeth, which has not been previously reported in the scientific literature in association with the degree of crowding of the anterior teeth.

Al-Bitar *et al*.,[1] in their study on bullying in Jordanian schoolchildren did not quantify crowding in millimeters neither did they compare it between patients with and without bullying experiences, unlike in our study.

Bazán-Serrano *et al*.,[3] reported that general bullying and that related to teeth's appearance was more frequent among public school students, while Mello *et al*.,[4] showed high frequency of general bullying in private schools.

However, these studies[3,4] and others that evaluated bullying and dentofacial characteristics,[1,2] did not report if the crowding of the anterior teeth had an impact on the presence of bullying, as we did in our study.

Quito-Rabanal *et al*.,[10] evaluated whether the type of malocclusion could be related to bullying; however, this relationship could not be evidenced, possibly because a classification of malocclusions was considered based on the relationship of the posterior teeth at the level of first molars.

By focusing the evaluation exclusively on the anterior teeth, as is the case of the present study, it was possible to demonstrate that the presence of greater crowding in the anterior teeth makes it more likely that the student is a victim of bullying.

The influence of other variables was not considered in the present study, which would justify a later multivariate study design. However, despite this limitation, the results point to considering crowding of the upper anterior teeth a greater concern in relation to bullying. For this reason, we suggest considering the measurement of the crowding variable in the same way we did in the present work for sub-sequent multivariate studies. The results reported in this study support the importance of early correction of dental crowding during school life, especially if this affects the anterior teeth, which could contribute to the reduction of bullying in school children.

CONCLUSION.

Dental crowding was greater in schoolchildren experiencing bullying compared to schoolchildren without bullying.

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