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Čimbenici rizika za nastanak traumatskih ozljeda kruna gornjih sjekutića

Risk Factors of Traumatic Injuries to the Upper Incisors

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Sažetak
Svrha studije bila je ustanoviti učestalost i čimbenike rizika za nastanak traumatskih ozljeda kruna gornjih sjekutića. **Ispitanici i postupci:** U ispitivanje je bilo uključeno 580 ispitanika (302 dječaka i 278 djevojčica) u dobi između 7 i 15 godina, a slučajno su odabrani u nekoliko osnovnih škola u Republici Hrvatskoj. Analizirana su sljedeća svojstva: čestoća trauma kruna sjekutića, spol, ortodontska anomalija, eksponiranost sjekutića, kompetentnost usana, overjet i vrijednost maksimalnog otvaranja usta. **Rezultati:** Trauma krune pronađena je kod 12,4% ispitanika. Bila je češća kod dječaka (17,8%) nego kod djevojčica (6,5%). Najzastupljeniji oblik bila je nekomplicirana trauma, koja je zahvaćala samo caklinu zuba (80%). **Zaključak:** Učestalost pojavljivanja trauma nije bila povezana s izmjerenom vrijednosti maksimalnog otvaranja usta, ni s vrstom malokluzije ili overjetom. Ispitanici s većom vrijednošću razmaka između usana (inkompetentne usne) i većom eksponiranošću sjekutića pokazali su više rizika za nastanak traume gornjih sjekutića.

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Ključne riječi
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Uvod

Traumatske ozljede zuba kod djece i adolescenata ozbiljan su zdravstveni problem, jer su u stalnom porastu posljednjih nekoliko desetljeća. Određene vrste ozljeda karakteristične su za određenu životnu dob, s obzirom na etiologiju i način nastanka. Rizična skupina za nastanak traumatskih ozljeda zuba su djeca školske dobi (od 7 do 15 godina). U mješovitoj denticiji traume najčešće nastaju kod djece između 6 i 9 godina te između 10 i 12 godina, a znatno rjeđe kod starije djece (1-5). Prema stajalištu većine autora, traume zuba su češće kod dječaka samo u trajnoj denticiji. U mješovitoj denticiji nije

Introduction

Traumatic dental injuries in children and adolescents are a serious health problem, and they have shown a steady increase in last decades. Certain types of injuries are characteristic to a certain age due to their aetiology or mechanism. School-age children (7-15 years) are considered to be a risk group to traumatic injuries of the teeth. Trauma in the mixed dentition occurs most frequently between 6 and 9 and between 10 and 12 years of age, and is less frequent in older children (1-5). According to the majority of authors, teeth trauma are more frequent in boys than in girls only in permanent dentition. In mixed denti-

nađena statistički znatna razlika između spolova (2, 5, 6-13). Objavljeni rezultati istraživanja na različitim populacijama vezanih za to koliko su česte traume zuba jako se razlikuju, pa tako stopa učestalosti varira između 2,6% i 50% (2, 9, 11, 14-24). Takva velika razlika među pojedinim populacijama posljedica je različitih vrsta istraživanja, raznovrsnih klasifikacija trauma i metodologija te zemljopisnih i bihevioralnih razlika između populacija na kojima su obavljena istraživanja (20).

Sjekutići imaju važnu zadaću u estetici, fonaciji, psihološkom aspektu i funkciji (15). Gornji trajni sjekutići najčešće su zahvaćeni traumom - više od 90% (25), a prema mišljenju Sarogla i suradnika, čak 95,72% (2). Njihova morfologija i lokacija čine ih pogodnima za takve ozljede (19). U trajnoj denticiji je vjerojatniji nastanak traume krune zuba bez ozljede okolnih tkiva. Najčešće su nekomplicirane frakture zubne krune koje zahvaćaju samo caklinu (1, 13, 15, 17, 22).

Etiologija dentalnih ozljeda je višestruka. Najvažniji čimbenici koji najčešće uzrokuju traumu su športske aktivnosti te nezgode u školi i kod kuće (1, 26, 27). Prema dostupnoj literaturi, predisponirajući čimbenici za nastanak traume zuba su veća vrijednost overjeta, inkompetencija usana, eksponiranost sjekutića i klasa II (1, 11-13, 15, 19-22, 26-32). Prema tome, možemo zaključiti da je zadatak ortodontske terapije i prevencija ozljeda protrudiranih sjekutića (13).

Svrha ovog istraživanja bila je odrediti koliko su česte traumatske ozljede krune gornjih trajnih sjekutića i utjecaj različitih čimbenika (spol, vrijednost overjeta, kompetentnost usana, ekspozicija sjekutića, vrijednost maksimalnog otvaranja usta) kad je riječ o njihovu nastanku kod djece školske dobi.

Ispitanici i postupci

U ovom ispitivanju uzorak se sastojao od 580 djece (302 dječaka i 278 djevojčica), a odabrani su slučajnim odabirom u nekoliko osnovnih škola u Republici Hrvatskoj. Prije početka istraživanja, roditelji su potpisali informirani pristanak za sudjelovanje njihove djece u istraživanju. Etičko povjerenstvo Stomatološkog fakulteta u Zagrebu odobrilo je provedbu studije. Djeca sa započetom ili završenom ortodontskom terapijom bila su isključena iz istraživanja. Pregledi su obavljeni pod umjetnim svjetlom uz korištenje stomatološkog zrcala i sonde. Svi su

tion no statistically significant differences have been recorded between the genders (2, 5, 6-13). The results published for various populations regarding the frequency of teeth trauma in children are considerably different. The percentages presented in the literature range from 2.6% to 50% (2, 9, 11, 14-24). Such a wide range in the prevalence of dental trauma is a consequence of various types of research, various trauma classifications, different methodologies, and both geographic and behavioural differences between populations in which the studies were obtained (20).

Incisors have an important role in aesthetics, phonation, psychological aspect and functional activities (15). Upper permanent incisors are the most frequently affected teeth by trauma, over 90% (25), according to Saroglu et al. even 95.72% (2). Morphology and location make them liable to traumatic injuries (19). The supporting tissues are more exposed in mixed dentition. Crown fractures without the injury of supporting structures can be found most likely in the permanent dentition. The highlights are on non-complicated crown fractures affecting only the enamel (1, 13, 15, 17, 22).

The aetiology of teeth injuries is variable or multiple. The dominant factors most likely to cause the trauma are sport activities and accidents at school and at home (1, 26, 27). Predisposing factors for teeth trauma are an increased overjet, lip incompetence, incisor exposure, and Class II malocclusion (1, 11-13, 15, 19-22, 26-32).

Beside the large number of studies published on traumatic injuries to the teeth, there are no results published on the risk factors and the prevalence of trauma to the upper permanent incisors in the Republic of Croatia. The purpose of this study was to determine the frequency of the upper permanent incisors trauma and the influence of occlusal characteristics in school children.

Material and Methods

In this study randomly selected 580 subjects (302 boys and 278 girls) in the age between 7 and 15 years, attending primary schools in Zagreb, Croatia, were examined. Before the beginning of the research, the subjects' parents have signed the informed consent to the participation of their children in the study. The examination was performed under artificial light using mouth mirrors and probe. All data were recorded on examination form. Demographic data included name, age and gender. Upper incisor injury was classified as: enamel trauma,

podaci zabilježeni u već pripremljen obrazac. Demografski podaci uključivali su ime, dob i spol djeteta. Ozljede gornjih sjekutića bile su klasificirane kao: trauma cakline, trauma cakline i dentina (nekomplicirana), ekspozicija pulpe i prisutnost restoracije-nemogućnost određivanja statusa traume. Testom vitaliteta bilo je određeno je li prije postojala komplicirana trauma krune gornjih sjekutića. Koristio se test hladnoćom (Li Wa Cool, W+P Dental, Beveren, Njemačka). Iz istraživanja su bile isključene traume koje su zahvaćale korijen zuba ili alveolarnu kost. Malokluzije su bile klasificirane prema Angleovu sustavu: klasa I, klasa II i klasa III. Veličina overjeta bila je izmjerena kliznom mjerkom između labijalne površine najprominentnijeg gornjeg središnjeg sjekutića i labijalne površine najprominentnijeg donjeg sjekutića. Razmak između usana mjeren je od najniže točke gornje usne do najviše točke gornje usne u središnjoj liniji upotrebom klizne mjerke. Vrijednost maksimalnog otvaranja usta bila je izmjerena kliznom mjerkom kao udaljenost između incizalnih bridova gornjih i donjih središnjih sjekutića tijekom maksimalnog otvaranja usta. Eksponiranost sjekutića određena je na gornjim središnjim sjekutićima uporabom milimetarskog ravnala tijekom mirovanja usana.

Podaci su bili analizirani statističkim paketom SAS© System za sučelje Windows 95. Koristila se univarijatna statistička analiza za usporedbu srednjih vrijednosti pojedinih različitih ispitivanih skupina. Uporabom χ^2 testa i Fisherova testa analizirana je distribucija svih izmjerenih vrijednosti u istraživanju. Rabljen je Wilcoxonov neparametrijski test za usporedbu srednjih vrijednosti između različitih ispitivanih skupina. Svi su testovi bili obavljeni na statistički znatnoj razini od 0,05.

Rezultati

Uzorak je činilo 580 ispitanika: 302 dječaka (52%) i 278 djevojčica (48%). Trauma krune gornjih sjekutića pronađena je kod 72 ispitanika (12,4%). Najčešća je bila trauma koja je zahvaćala samo caklinu (80%) (Slika 1.). Kod dječaka je pronađeno više trauma negoli kod djevojčica – 17,8% prema 6,5% (p<.001) (Tablica 1.). Nije bilo statistički velike povezanosti između vrste malokluzije i čestoće nastanka traume (Tablica 2.).

Prosječna vrijednost overjeta kod dječaka bila je 3,6 mm, a kod djevojčica 3,4 mm, kao što je prikazano u Tablici 3. Wilcoxonov test je pokazao statistički veliku razliku srednjih vrijednosti veličine overjeta (p=.031) s obzirom na spol. Overjet nije bio statistič-

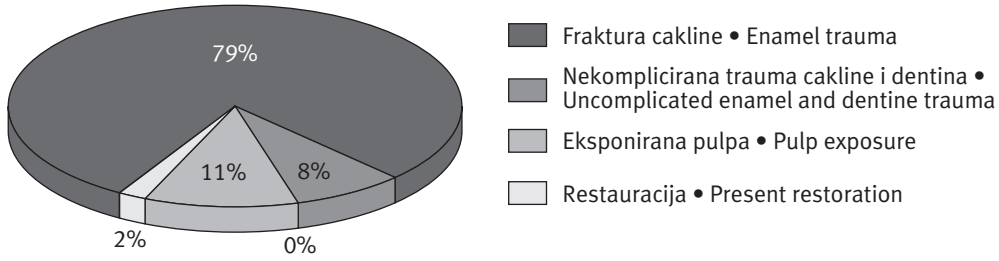
enamel and the dentine trauma (non-complicated), pulp exposure, restoration present - trauma status not determinable, and luxation. The pulp exposure, or the existence of a previous complicated upper incisors crown trauma, was determined by the vitality test. The cold test (Li Wa Cool, W+P Dental, Beveren, Germany) was used. Traumas affecting the tooth root or the alveolar bone were excluded from the research. Malocclusions were classified according to Angle classification system: Class I, Class II and Class III. Overjet was measured by sliding calliper from the labial surface of the most prominent upper central incisor to the labial surface of the most prominent mandibular incisor. The interlabial gap was measured clinically from the lowest point of the upper lip to the highest point of the lower lip at the midline, using a sliding caliper in rest position. Maximum vertical opening of the mandible was measured with sliding caliper as the distance between incisal edges of the maxillary and mandibular central incisors while opened as wide as possible.

All measured characteristics were compared based upon age, gender and upper incisor trauma. The data were analyzed with the SAS© System statistical package for Windows 95 platform. Univariate statistical analysis were used to compare the mean values between different examination groups. The χ^2-test and The Fisher test were used to analyze the distribution of all the measurement in this study. The Wilcoxon rank-sum nonparametric test was used to compare the mean values between different examination groups. All the tests were performed at the statistical significance 0.05.

Results

The sample consisted of 580 subjects: 302 boys (52%) and 278 girls (48%). Upper incisors crown trauma was found in 72 subjects (12.4%), and in 80% of these only the enamel was affected (Figure 1). Boys experienced more traumatic teeth injuries than girls, 17.8% and 6.5% respectively (P<.001) (Table 1). The type of malocclusion has no statistically significant relationship to the trauma frequency (Table 2).

The overjet in male subjects was on the average 3.6 mm, and in females on the average 3.4 mm, as shown in Table 3. The Wilcoxon's rank sum test showed a statistically significant difference between the mean values of the size of overjet (P=.031) in re-



Slika 1. Distribucija trauma gornjih sjekutića.
Figure 1 The distribution of upper incisor trauma.

Tablica 1. Distribucija čestoće traumatskih ozljeda gornjih sjekutića s obzirom na spol.
Table 1 Frequency distribution of upper incisor traumatic injuries according to gender.

	Ukupno • Total		Muško • Male		Žensko • Female		
	N=580		N=302		N=278		
	N	%	N	%	N	%	P*
Trauma							
Bez traume • No trauma	508	87.6	248	82.1	260	93.5	<.001
Fraktura cakline • Enamel trauma	57	9.8	40	13.2	17	6.1	
Uncomlicated enamel and dentine trauma	6	1.0	6	2.0	0	0.0	
Eksponirana pulpa • Pulp exposure	0	0.0	0	0.0	0	0.0	
Restauracija • Present restoration	8	1.4	7	2.3	1	0.4	
Uganuće • Luxation	1	0.2	1	0.3	0	0.0	
Trauma donjeg lica • Lower face trauma							
Prednji zubi • Frontal teeth							
Ne • No	511	88.1	250	82.8	261	93.9	<.001
Da • Yes	69	11.9	52	17.2	17	6.1	
Usnice • Lips							
Ne • No	574	99.0	300	99.3	274	98.6	
Da • Yes	6	1.0	2	0.7	4	1.4	

* P-value Wilcoxon rank sum test

Tablica 2. Distribucija čestoće traumatskih ozljeda gornjih sjekutića s obzirom na vrstu malokluzije.
Table 2 Frequency distribution of upper incisor traumatic injuries according to malocclusion.

	Ukupno • Total		Bez traume • No trauma		Trauma		
	N=580		N=508		N=72		
	N	%	N	%	N	%	P*
Malokluzija • Malocclusion							
Angle Class I	347	59.8	307	60.4	40	55.6	>.001
Angle Class II	211	36.4	180	35.4	31	43.1	
Angle Class III	22	3.8	21	4.1	1	1.4	

* P value (chi-square test and Fisher test)

Tablica 3. Distribucija čestoće traumatskih ozljeda gornjih sjekutića s obzirom na kompetentnost usana i ekspoziciju sjekutića.
Table 3 Frequency distribution of upper incisor traumatic injuries according to interlabial distance and incisor exposure.

Trauma gornjih sjekutića • Upper incisors trauma										
	Ukupno • Total			Ne • No			Da • Yes			
	N	Mean	SD	N	Mean	SD	N	Mean	SD	P*
Pregriz • Overjet	575	3.5	1.6	569	3.5	1.6	6	5.5	3.9	NS
Maksimalno vertikalno otvorena usta • Maximum vertical opening of the mandible	578	45.0	5.8	572	45.0	5.8	6	44.1	9.8	NS
Razmak između usnica • Interlabial distance	580	0.1	0.9	574	0.1	0.9	6	0.6	1.5	.023
Vidljivost sjekutića • Incisor exposure	580	0.1	0.6	574	0.1	0.6	6	0.5	1.2	.023

* P-value Wilcoxon rank sum test

ki znatno povezan s čestoćom nastanka traume, iako je nađena veća vrijednost overjeta kod dječaka, te veća čestoća nastanka trauma krune gornjih sjekutića. Prosječna vrijednost maksimalnog otvaranja usta kod dječaka je bila 45,4 mm, a kod djevojčica 44,6 mm te nije bila povezana s nastankom traume. Prosječna vrijednost razmaka između usana je bila 0,1 mm za obje spolne skupine. Srednja ekspozicija sjekutića kod obje skupine bila je 0,1mm. Pronađena je statistički velika povezanost između nastanka traume i veličine razmaka između usana (p=,023) te između nastanka traume i ekspozicije gornjih sjekutića (p=,023), kao što je prikazano u Tablici 3.

Rasprava

Čestoća nastanka traume prema dostupnoj literaturi varira između 2,6% i 50% (2, 9, 11, 14-24), ovisno o populaciji na kojoj se obavljala analiza. Većina autora navodi da čestoća traume u području stomatognatog sustava varira između 10% i 20%. U ovom istraživanju je bila 12,4%, što je u sklopu raspona rezultata objavljenih u literaturi. Dosta je teško usporediti rezultate ovog istraživanja s rezultatima drugih autora, s obzirom na etničke razlike, ponajprije s obzirom na zemljopisne i bihevioralne karakteristike (1, 13, 15, 28). Budući da je Republika Hrvatska smještena u mediteranskom pojasu, rezultate istraživanja moguće je usporediti s rezultatima autora čije su studije obavljene na istom zemljopisnom području. Postotci trauma od 17,4% (17), 19,3% (22), 20,26% (12) te 11,7% (34) odgovaraju i našim rezultatima.

Čestoća traume gornjih sjekutića bila je veća u skupini dječaka (17,8%), nego u skupini djevojčica (6,5%), što se podudara s rezultatima većine drugih autora (2, 5, 6-13, 22). To se može objasniti većom uključenosti dječaka u kontaktne športove, a oni su čest uzrok traume. Unatoč tome, Burden (1) je objavio dosta neobične rezultate u kojima nije bilo statistički znatne razlike između čestoće nastanka traume gornjih sjekutića kod dječaka i djevojčica. To je objasnio porastom sudjelovanja djevojčica u športskim aktivnostima koje mogu uzrokovati traumu. Baghdady i suradnici (33) pronašli su više trauma kod djevojčica negoli kod dječaka u dobnoj skupini mlađoj od 9 godina.

S obzirom na vrstu traume, najčešća je bila ozljeda cakline zuba (80%). Slične su rezultate objavili Kania i suradnici (13), ali i većina drugih autora (1, 13, 15, 17, 22).

U mnogobrojnim studijama ističe se povezanost traume gornjih inciziva s klasom II, povećanom vrigard to gender. Boys showed a greater overjet. The overjet had no statistically significant relationship to the frequency of injury. Although higher values of overjet were found in boys, as well as higher frequency of upper incisor trauma. Mean maximum opening in boys was 45.4 mm and 44.6 mm in girls, with no relation to trauma. Mean value of interlabial distance was 0.1 mm for all subjects. Mean incisor exposure was 0.1 mm for both groups. Upper incisor trauma was statistically significant in correlation to the size of the interlabial distance (P=.023) and the upper incisors exposure (P=.023), as shown in Table 3.

Discussion

The prevalence of trauma presented in literature ranges from 2.6% to 50% (2, 9, 11, 14-24), depending on the population in which the studies were obtained. The majority of authors specify the frequency of trauma to the stomatognatic system ranging from 10% to 20%. The prevalence of trauma in this study was 12.4%, which corresponds to the results published in literature. It is difficult to compare our results with the results of other authors due to the ethnic differences, primarily in respect to geographic and behavioural characteristics (1, 13, 15, 28). The Republic of Croatia is situated in the Mediterranean area, so the results from our study should be compared with the results of the authors who published the data in the same geographic area. Therefore the prevalence of 17.4% (17), 19.3% and 9.7% (22), 20.26% (12) and 11.7% (34) correspond to our result.

The frequency of the upper incisors trauma was higher in boys (17.8%) than in girls (6.5%), which is in agreement to the findings of the majority of authors (2, 5, 6-13, 22). This might be explained by the fact that boys are more engaged in contact sports, which often lead to teeth trauma. However, Burden (1) revealed unusual result of no statistically significant difference in the frequency of upper incisors trauma in boys and in girls. He explained that this might be due to the increase of the girls' participation in sports leading to trauma. Baghdady et al. (33) found a higher prevalence of trauma in girls younger than nine years and in older boys.

Regarding the type of trauma the most frequent was enamel injury (80%). Similar results were obtained by Kania et al. (13) as well as by other authors (1, 13, 15, 17, 22).

Numerous studies point out the association between the upper incisors trauma and Class II mal-

jednošću overjeta, povećanom ekspozicijom sjekutića i inkompetencijom usana (1, 11-13, 15, 19-22, 26-32). Petti i Tarsitani (12) te Nguyen i suradnici (28) pronašli su da osobe s vrijednošću overjeta od 3 mm imaju dva puta veću vjerojatnost za nastanak traume od osoba s normalnim overjetom. Zaragoza i suradnici (16) istaknuli su da 24,5% osoba s traumom zuba ima overjet veći od 3 mm. Prema Sorianu i suradnicima (21), vrijednost overjeta veća od 5 mm povezana je s čestoćom traume gornjih sjekutića. Prema Artunu i suradnicima (22), ako je vrijednost overjeta između 6,5 mm i 9 mm, rizik za nastanak traume je 2,8 puta veći, a kod vrijednosti overjeta veće od 9 mm rizik je veći 3,7 puta. Rezultati te studije nisu pokazali statistički veliku povezanost klase II i povećane vrijednosti overjeta s većom čestoćom nastanka traume. To se može objasniti činjenicom da je kod većine ispitanika bila prisutna klasa I (59,8%) te da je prosječna vrijednost overjeta za sve ispitanike bila 3,5 mm. Marcenes i suradnici (32) nisu pronašli statistički znatnu razliku u povezanosti overjeta i traume zuba, što je u skladu s našim rezultatima.

Sličan je i zaključak Kanije i suradnika (13). Oni su pronašli manji razmak između usana kod ispitanika s traumom zuba - razlika je bila statistički velika. Rezultati ovog istraživanja pokazuju statistički znatnu povezanost između kompetentnosti usana, traume gornjih sjekutića i eksponiranosti sjekutića. Inkompetentnost usana bila je češća kod ispitanika s traumom zuba. Većina autora istaknula je veću čestoću trauma sjekutića kod ispitanika s inkompetencijom usana (11-13, 15, 19-22, 26-32). Burden (1) također smatra kako inkompetencija usana ima važnu ulogu u čestoći trauma zuba te da veličina razmaka između usana ima važniju ulogu u čestoći nastanka trauma nego vrijednost overjeta. U našoj studiji pronađena je statistički velika povezanost ekspozicije gornjih sjekutića i traume krune (p=,023) - trauma je bila češća kod više eksponiranih sjekutića, što se slaže s rezultatima Kanije i suradnika (13). Kao rezultat metaanalize, rezultati ove studije i rezultati objavljeni u literaturi, sugeriraju da je potrebna ortodontska terapija kod djece s većim rizikom za nastanak traume gornjih sjekutića. Još postoji nesklad u mišljenjima pojedinih autora o tome kada je pravo vrijeme za početak ortodontske terapije radi prevencije traume prednjih zuba.

occlusion, the increased overjet, the increased incisors exposure and the lip incompetence (1, 11-13, 15, 19-22, 26-32). Petti and Tarsitani (12) found that in subjects with an overjet of 3 mm there is twice higher possibility for the incidence of trauma than in subjects with a normal overjet, as well as Nguyen et al. (28). Zaragoza et al. (16) found that 24.5% of subjects with teeth trauma have an overjet greater than 3 mm. Soriano et al. (21), considered that the overjet greater than 5 mm is associated with the frequency of the upper incisors trauma. Artun et al. considered that the overjet is a predisposing factor for the frequency of teeth trauma. If the overjet is between 6.5 mm and 9 mm, the risk of trauma is 2.8 times higher, whereas if the overjet is greater than 9 mm, this risk is 3.7 times higher (22). This may be explained by the fact that the greatest number of subjects exhibiting Class I (59.8%) and the average value of the overjet of all subjects was 3.5 mm. Marcenes et al. (32) did not find any statistically significant differences in the correlation between overjet and the teeth trauma, what is in accordance to the results of our study.

The same conclusion was made by Kania et al. (13). They found a smaller interlabial distance in trauma subjects with statistical significance. The results of this research show statistically significant correlation between the lip competence, the upper incisor trauma and the incisor exposure. Lip incompetence was more frequent in trauma subjects. The majority of authors pointed out higher frequency of the incisors trauma in subjects with lip incompetence (11-13, 15, 19-22, 26-32). Burden also considers that lip competence plays an important role in the frequency of teeth trauma and that the size of interlabial distance has a more important role in the frequency of trauma than the amount of overjet (1). The results of this study show statistically significant correlation between upper incisor exposure and crown trauma (p=0.023) - trauma was more frequent in exposed incisors, which is similar to the Kania et al. (13) study. As a result of meta-analysis, the results from the literature suggest that orthodontic therapy is needed in children with higher risk for upper incisor trauma. This is supported by our results. There is still no consensus among the authors when is the right time to commence orthodontic treatment for the purpose of preventing trauma to the anterior teeth.

Zaključci

- Čestoća traumatskih ozljeda zuba bila je 12,4%.
- Najčešća vrsta traume bila je nekomplicirana trauma cakline (80%).
- Trauma krune gornjih sjekutića češća je kod dječaka (17,8%), negoli kod djevojčica (6,5%).
- Nije pronađena statistički znatna povezanost učestalosti nastanka traume krune gornjih sjekutića s veličinom overjeta.
- Ispitanici s inkompetentnim usnama i većom ekspozicijom sjekutića imali su statistički znatno veću čestoću trauma krune gornjih sjekutića.

Conclusion

- The prevalence of traumatic injuries to the teeth was 12.4%.
- The most frequent type of trauma was a non-complicated enamel trauma (80%).
- Upper incisors crown trauma is more frequent in boys (17.8%) than in girls (6.5%).
- No statistical difference was found between the prevalence of the upper incisors crown trauma and malocclusion and size of overjet.
- Subjects with greater interlabial distance and incisor exposure have statistically significant more frequent upper incisor trauma.

Abstract
Purpose: The purpose of this study was to determine the frequency of the upper incisors crown trauma and its relationship to orthodontic anomalies, as well as the influence of age, gender and occlusal characteristics. **Material and Methods:** In this study 580 subjects (302 boys and 278 girls) between 7 and 15 years were randomly selected from several primary schools in the Republic of Croatia. Following characteristics were examined: frequency of incisor trauma, gender, age, skeletal relationship, incisor exposure, interlabial distance, overjet and maximum vertical opening of the mandible. **Results:** crown trauma was found in the total of 12.4% frequency. It was more frequent in boys (17.8%) than in girls (6.5%). The most frequent type of trauma was a non-complicated trauma affecting only the enamel (80%). **Conclusions:** The trauma frequency was not related to the size of the maximum vertical opening of the mandible, to the type of malocclusion and the overjet. Subjects with greater size of interlabial distance and incisors exposure had shown more risk to upper incisor trauma.

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