



Cristiana Maria Palmela Pereira^{1*}, Adriana Resende dos Santos², Catarina Rodrigues Gonçalves², Valon Nushi³, Francisco Coutinho⁴, Francisco João Salvado e Silva¹, Rui Filipe Vargas de Sousa Santos⁵

Retrospective Study of Oral and Maxillofacial Trauma in Portuguese Population

Retrospektivna studija o oralnoj i maksilofacijalnoj traumi u portugalskoj populaciji

¹ Faculty of Dental Medicine and Faculty of Medicine, University of Lisbon, Portugal.

Stomatološki i Medicinski fakultet Sveučilišta u Lisabonu, Portugal

² Junior Researcher at the Centre of Statistics and Applications of University of Lisbon, Portugal

Znanstveni novak u Centru za statistiku i aplikacije Sveučilišta u Lisabonu, Portugal

³ Post-graduation Student Faculty of Medicine University of Lisbon, Portugal.

Student poslijediplomskog studija Medicinskog fakulteta Sveučilišta u Lisabonu, Portugal

⁴ Santa Maria Hospital – Lisbon, Portugal

Bolnica Santa Maria, Lisabon, Portugal

⁵ Department of Mathematics, School of Technology and Management, Polytechnic of Leiria, Portugal

Odjel za matematiku Fakulteta za tehnologiju i menadžment Veleučilišta u Leiriji, Portugal

Abstract

Objective: The increasing significance of medicolegal evaluation following maxillofacial traumatic events constitutes a complex issue. This clinical research aimed to assess the current etiology of oral and maxillofacial injuries in Portuguese population. **Material and methods:** An epidemiological clinical observational study was conducted in Centro Hospitalar Lisboa Norte on a sample of 384 subjects diagnosed with oral and maxillofacial trauma, between 2018 and 2020. Data were collected through clinical reports and analyzed using SPSS version 27. **Results:** Women and men were nearly identical in the number and distribution, with 49.5% females and 50.5% males. In 2020, there was a decrease in the number of traumatic incidents compared to other years. Falls or accidental descents were found to be the most common cause of injury, accounting for 44.3%, followed by assaults accounting for 24.7%. A total of 84 subjects exhibited soft tissue injuries related to periodontal region. The upper central incisors (174) were the most frequently affected teeth with uncomplicated fractures, and the predominant form of treatment was the administration of pain medication. **Conclusion:** A correlation between falls or accidental descents, female subjects, and advancing age, as well as between assaults, male subjects, and adults, has been established. Falls or accidental descents and assault were the predominant etiologies, and the year 2020 exhibited a decrease in the incidents of traumatic events.

Received: July 15, 2022

Accepted: February 13, 2023

Address for correspondence

Cristiana Palmela Pereira
Principal Investigator FORENSEMED
from UICOB
Faculdade de Medicina Dentária da
Universidade de Lisboa
Rua Professora Teresa Ambrósio
Cidade Universitária
1600-003 Lisboa, Portugal

MeSH Terms: Tooth Injuries;
Maxillofacial Injuries; Forensic
Dentistry; Disability Evaluation

Author Keywords: Trauma Oro-
maxillofacial; Injuries; Retrospective
Study; Forensic Medicine

0000-0002-9164-7189 (cpereira@campus.ul.pt)
0000-0003-1300-5057 (catarinagoncalves2@campus.ul.pt)
0000-0002-6965-9191 (adrianaresnde@campus.ul.pt)

0000-0002-6754-3988 (nushi.valon@gmail.com)
0000-0002-1095-8090 (fjsalvado2002@yahoo.com)
0000-0002-7371-363X (rui.santos@ipleiria.pt)

Introduction

The human organism encompasses four key dimensions: functional, biological, psychological, and social. Any disruption to any one of these dimensions can result in bodily harm, which encompasses any injury or sequel present in an individual caused by a disease, psychological disturbance, or traumatic event (1).

There are various forms of traumatic events, with the physical injuries being the most prevalent, thereby constituting a significant global health issue. Upon occurrence of a traumatic event, an individual may experience full recovery from the injury, a temporary impairment, or a sequel, which

Uvod

Ljudski organizam obuhvaća četiri ključne dimenzije: funkcionalnu, biološku, psihološku i socijalnu. Svaki poremećaj bilo koje od tih dimenzija može rezultirati tjelesnom ozljedom, što uključuje bilo koju ozljedu ili posljedicu za pojedinca prouzročenu bolešću, psihološkim poremećajem ili traumatskim događajem (1).

Oblici traumatskih događaja mogu biti različiti, a najzastupljenije su tjelesne ozljede koje su velik globalni zdravstveni problem. Nakon traumatskog događaja pojedinac se može potpuno oporaviti od ozljede, ali može nastati i trajno oštećenje što se očituje trajnom psihofiziološkom promjenom kao

manifests a permanent psychophysiological alteration resulting from the traumatic experience (2-11).

These injuries can manifest in various parts of the body. However, the present focus will be on oral and maxillofacial injuries which comprise any harm to the region of the oral cavity, including the teeth, tongue, mucosa, mandible, maxilla, zygomatic bones, vessels, nerves, temporomandibular joint, and the soft tissues that line the face.

Oral and maxillofacial injuries represent a significant proportion of medical emergencies, amounting to 7.4 to 8.7% in both developed and developing countries (12,13). The causes of such injuries vary from country to country. They are influenced by cultural, socioeconomic, and environmental factors (4,9,14-27), with the principal etiologies being traffic accidents, falls or accidental descents, and assault.

Treating these traumatic events is a quite complex task. Esthetic aspects are not the only aspects requiring consideration, but also the functional aspects of the affected structures, as well as the psychological impact that arises from traumatic experiences (4-6, 8,15,19,24,28-31).

The goal of the present observational retrospective clinical study was to discuss Portuguese epidemiological data regarding oral and maxillofacial trauma, in the trauma context. In addition, the aim was to assess the follow-up data between injury and sequelae, namely its associations according to etiology and types of oral and maxillofacial injuries. This is important considering that the importance of medicolegal evaluation after traumatic events has been increasing over the years and is a complex issue, mainly in the field of Forensic Odontology for a personal damage assessment.

Material and methods

To achieve the objectives of the research, a retrospective observational study was conducted in the Stomatology Service at the "Centro Hospitalar Lisboa Norte" (CHLN). The study sample comprised individuals aged 21 years or older who sustained oral and maxillofacial injuries between 2018 and 2020. The data collected from the CHLN database were analyzed according to guidelines of the STROBE recommendations.

The study has received ethical approval from the CHLN Ethics Committee, and due to its retrospective design, was exempt from written consent by the IRB of University of Lisbon and conducted in accordance with the Helsinki Declaration of October 2013.

The medical records of all patients were thoroughly reviewed, and the collected data were pseudonymized and recorded in Excel. The extracted information from each patient's records included demographics such as sex and age, date of injury, etiology, type of injury, location of trauma, type of treatment received, treatment duration, discharge date, duration of hospital stays, date of healing/consolidation, and any sequelae.

The location of trauma was divided into various parts of the oral and maxillofacial region, including gums, alveolar bone, teeth, tongue, buccal mucosa, upper and lower lip, vestibule, maxilla, maxillary sinus, mandible, nasal bone,

posljedicom traumatskog iskustva (2 – 11).

Te ozljede mogu biti na različitim dijelovima tijela. No u ovom radu fokus će biti na oralnim i maksilofacijalnim ozljedama koje obuhvaćaju bilo kakvu ozljedu u području usne šupljine, uključujući zube, jezik, sluznicu, donju čeljust, maksilu, zigomatične kosti, žile, živce, temporomandibularni zglob i meka tkiva oko lica.

Oralne i maksilofacijalne ozljede znatan su dio hitnih medicinskih stanja i iznose od 7,4 do 8,7 % u razvijenim zemljama i zemljama u razvoju (12, 13). Uzroci takvih ozljeda razlikuju se od zemlje do zemlje. Na njih utječu kulturološki, socioekonomski i okolišni čimbenici (4, 9, 14 – 27), a glavni uzrok su prometne nesreće, padovi ili slučajna spuštanja te napadi.

Liječenje tih traumatskih događaja dosta je složen zadatak. Estetski aspekti nisu jedini koji zahtijevaju razmatranje, tu su i funkcionalni aspekti zahvaćenih struktura, ali i psihološki utjecaj koji nastaje zbog traumatskih iskustava (4 – 6, 8, 15, 19, 24, 28 – 31).

Cilj ove opservacijske retrospektivne kliničke studije bio je istaknuti portugalske epidemiološke podatke te raspravljati o oralnoj i maksilofacijalnoj traumi u kontekstu traume. Uz to, željeli su se procijeniti podatci o praćenju između ozljede i posljedica, odnosno njihova povezanost s etiologijom i vrstama oralnih i maksilofacijalnih ozljeda. To je bitno s obzirom na to da važnost sudsko-medicinske evaluacije poslije traumatskih događaja tijekom godina raste i složeno je pitanje, uglavnom u području forenzičke odontologije za procjenu osobne štete.

Materijal i metode

Kako bi se postigli ciljevi istraživanja, provedena je retrospektivna opservacijska studija u Stomatološkoj službi Bolničkoga centra Lisabon - sjever (Centro Hospitalar Lisboa Norte – CHLN). Uzorak je obuhvaćao osobe u dobi od 21 godine ili starije koje su imale oralne i maksilofacijalne ozljede između 2018. i 2020. Podatci prikupljeni iz baze podataka CHLN-a analizirani su prema smjericama STROBE preporuka.

Studiju je odobrio Etički odbor CHLN-a, a zbog njezina retrospektivnog dizajna nije bio potreban pisani pristanak IRB-a Sveučilišta u Lisabonu i provedena je u skladu s Helsinškom deklaracijom iz listopada 2013.

Medicinska dokumentacija svih pacijenata temeljito je pregledana, a prikupljeni podatci su i evidentirani u Excelu. Izdvojeni podatci iz kartona svakog pacijenta obuhvaćali su demografske podatke kao što su spol i dob, datum ozljede, etiologiju, vrstu ozljede, mjesto traume, vrstu i trajanje liječenja, datum otpusta iz bolnice, trajanje hospitalizacije, datum ozdravljenja/konsolidacije i sve posljedice.

Mjesto traume podijeljeno je na različite dijelove oralne i maksilofacijalne regije, uključujući desni, alveolarnu kost, zube, jezik, bukalnu sluznicu, gornju i donju usnicu, predvorje, maksilu, maksilarni sinus, mandibulu, nosnu kost, frakture prema Le Fortu, zigomatski luk, orbitalnu površinu, temporomandibularni zglob i meka tkiva. Prijelomi donje čeljusti

Le Fort, zygomatic arch, orbital surface, temporomandibular joint, and soft tissues. Mandibular fractures were additionally classified based on their anatomical location into various categories including body, angle, ramus, symphysis, condyle, and coronoid.

The collected data were processed using the Statistical Package for the Social Sciences (SPSS), version 27. Descriptive and inferential statistical analysis was conducted to meet the requirements of the study.

Hypothesis testing was carried out utilizing binomial and chi-square tests, and Clopper-Pearson 95% confidence intervals (95% CI), and contingency coefficients were calculated to validate the findings.

Results

Demographic distribution

A total of 384 patients were analyzed, with 190 females (49.48%) and 194 males (50.52%). The distribution of patients with oral and maxillofacial traumas over the years 2018, 2019, and 2020 is presented in Table 1. It can be observed that the highest number of patients was recorded in 2019, and the lowest in 2020.

Most frequently affected age group was individuals between the ages of 21 to 29. A higher prevalence of male individuals was observed in the age group between 21 and 49, whereas a higher prevalence of female individuals was noted in the age group between 50 and 93. Statistical analysis revealed a significant association between age and sex, as indicated by p -value < 0.001 , and a contingency coefficient $CC = 0.305$.

dotatno su klasificirani na temelju njihove anatomske lokacije u različite kategorije uključujući tijelo, kut, ramus, simfizu, kondilu i koronoid.

Prikupljeni podatci obrađeni su u statističkom paketu za društvene znanosti (SPSS), verzija 27. Deskriptivna i inferencijalna statistička analiza provedena je da bi se zadovoljili zahtjevi studije.

Testiranje hipoteza obavljeno je korištenjem binomnoga i hi-kvadrat testa te Clopper-Pearsonovih 95 % intervala pouzdanosti (95 % CI), a za potvrdu nalaza izračunati su koeficijenti kontingencije.

Rezultati

Demografska distribucija

Analizirana su ukupno 384 bolesnika – 190 žena (49,48 %) i 194 muškarca (50,52 %). Distribucija pacijenata s oralnim i maksilofacijalnim traumama tijekom 2018., 2019. i 2020. godine nalazi se u tablici 1. Uočava se da je najviše pacijenata bilo 2019. godine, a najmanje 2020.

Najčešće zahvaćena dobna skupina bile su osobe u dobi od 21 do 29 godina. Veća prevalencija muškaraca uočena je u skupini između 21 i 49 godina, a veća prevalencija žena zabilježena je u dobi između 50 i 93 godine. Statistička analiza otkrila je značajnu povezanost između dobi i spola, što je naznačeno p -vrijednošću $< 0,001$ i koeficijentom kontingencije $CC = 0,305$.

Table 1 Sample distribution according to age and year in which trauma occurred
Tablica 1. Raspodjela uzorka prema dobi i godini u kojoj se trauma dogodila

Year/Age • Dob	21-29	30-39	40-49	50-59	60-69	70-79	80-89	90-93	Total
2018	35	26	19	13	20	8	6	1	128
2019	37	43	42	11	21	13	8	0	175
2020	27	16	17	6	9	4	2	0	81
Total • Ukupno	99	85	78	30	50	25	16	1	384

Etiology

Accidental fall was the primary cause of maxillofacial injuries, accounting for 44.3% (170 patients) of all cases. Assault was the second most common cause accounting for 24.7% (95 patients) of the cases. As shown in Figure 1, falls are more prevalent among female patients (60.4%), while male patients are more likely to sustain injuries from assault (33.5%). The incidents of sports- and work- related accidents decreased in 2020. The probability of sustaining a fall was estimated to be between 39.9% and 50.1% (95% CI), while the probability of sustaining an injury from assault was estimated to be between 20.8% and 29.8% (95% CI).

A statistical association between etiology and sex was established (p -value < 0.001 e $CC = 0.335$), with female patients being more likely to sustain a fall (53% - 67.5%) and male patients being more likely to sustain an injury from assaults (26.9% to 40.7%), (95% CI).

Etiologija

Slučajni pad bio je primarni uzrok maksilofacijalnih ozljeda u 44,3 % (170 pacijenata) svih slučajeva. Napad je bio drugi najčešći uzrok s 24,7 % (95 pacijenata) slučajeva. Kao što se vidi na slici 1. padovi su češći među pacijenticama (60,4 %), a kod muškaraca vjerojatnije su ozljede nastale zbog napada (33,5 %). Incidenti povezani sa sportom i radom smanjili su se u 2020. Vjerojatnost pada procijenjena je na 39,9 % do 50,1 % (95 % CI), a vjerojatnost ozljede od napada između 20,8 i 29,8 % (95 % CI).

Utvrđena je statistička povezanost između etiologije i spola (p -vrijednost $< 0,001$, $CC = 0,335$), s većom vjerojatnošću da će pacijentice pasti (53 % – 67,5%), a pacijenti biti ozlijeđeni u napadu (26,9 % do 40,7 %), (95 % CI).

Utvrđeno je da postoji povezanost između uzroka maksilofacijalnih ozljeda i dobi (p -vrijednost $< 0,001$; $CC = 0,526$), pri čemu su mlađe osobe podložnije napadima, a s

It has been established that there is a relationship between the cause of maxillofacial injuries and age (p -value <0.001 ; $CC=0.526$), with younger individuals being more susceptible to assaults, while falls become more prevalent as age increases. However, no statistical correlation has been found between the cause of maxillofacial injuries and the year in which the accident occurred.

Types and sites of trauma

The classification of maxillofacial injuries was made based on various factors such as skin, bone, dental, periodontal, neurological, and the combinations between these factors. The predominant form of injury was found to be a combination of skin and periodontal injury, affecting 84 patients

godinama sve su češći padovi. No nije pronađena statistička korelacija između uzroka maksilofacijalne ozljede i godina kada se nezgoda dogodila.

Vrste i mjesta traume

Klasifikacija maksilofacijalnih ozljeda napravljena je na temelju različitih čimbenika poput kože, kosti, zuba, parodonta te neuroloških čimbenika i njihovih kombinacija. Ustanovljeno je da je kod 84 pacijenta dominantni oblik ozljede kombinacija ozljede kože i parodonta (21,9 %), a slije-

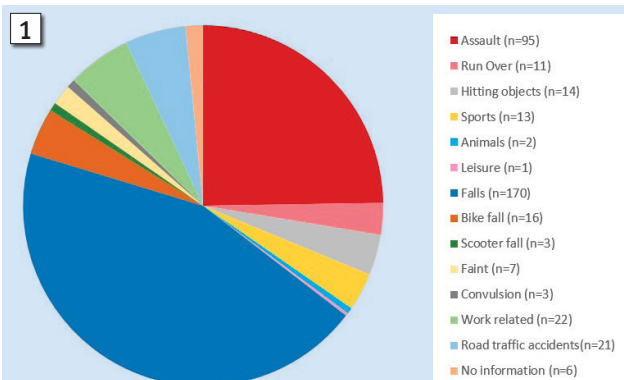


Figure 1 Causes of maxillofacial fractures in 270 patients. n = number of patients

Slika 1. Uzroci maksilofacijalnih prijeloma kod 270 bolesnika. n = broj pacijenata

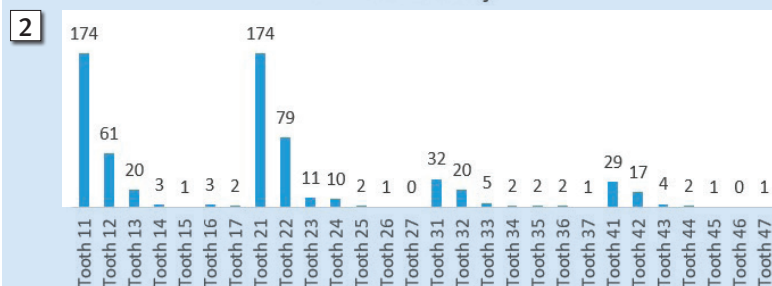
Figure 2 Site of dental injuries. Teeth are classified according to FDI - World Dental Federation notation

Slika 2. Mjesto ozljede zuba – zubi su klasificirani prema klasifikaciji Svjetske stomatološke federacije (FDI)

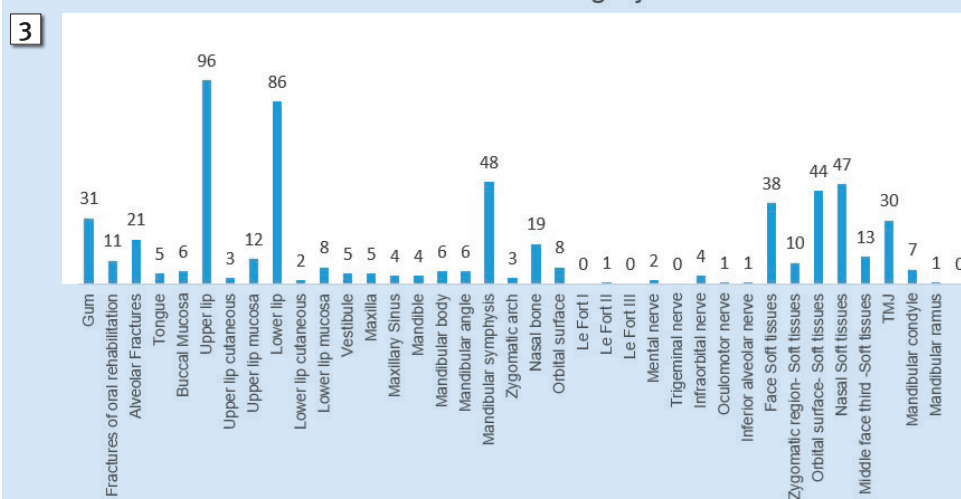
Figure 3 Distribution by site of the remaining injuries found in the articles

Slika 3 Distribucija prema mjestu preostalih ozljeda pronađenih u člancima

Site of dental injuries



Site of the remaining injuries



(21.9%), which was followed by skin injuries alone, affecting 68 patients (17.7%). A statistical analysis revealed no significant correlation between the type of injury and demographic variables such as sex (p -value = 0.36), year of accident (p -value = 0.324) and age (p -value = 0.266). Further analysis revealed that skin injuries combined with periodontal lesions ($n=39$; $n=24$), skin injuries ($n=32$; $n=19$), where the most frequently observed types of injuries in cases involving falls were skin injuries combined with dental lesions ($n=28$; $n=13$).

Out of the 384 patients, 314 were diagnosed with soft tissue injuries, 57 exhibited bone fractures, 192 had periodontal injuries, 176 sustained dental injuries, and only 5 were found to have neurological injuries.

The most affected sites were the upper central incisors, with 174 injuries recorded at each site, followed by the upper lip with 96 patients and the lower lip with 86. Injuries in the coronoid apophysis, upper left second molar, lower right first molar (teeth 27 and 46, respectively, as per the FDI - World Dental Federation notation), Le Fort I, and Le Fort III were not detected. Figures 2 and 3 provide an illustration of the distribution of the injury sites. The most prevalent injury in the lips was laceration, while swelling and abrasion were frequently observed in the soft tissue injuries. All of the neurological injuries were diagnosed as hypoesthesia.

The mandibular region has been the most frequently affected area ($n=20$) regarding bone fractures. This distribution is presented in Table 2. As for dental injuries, uncomplicated crown fractures were the predominant type observed in the upper incisors.

Management of the trauma

Out of 348 patients, 218 underwent surgical treatment, 79 received dental treatment, 210 conservative treatment, and 278 patients received pharmacological treatment.

The most frequent pharmacological treatment was the prescription of pain medication ($n=101$; 26.8%). Among the surgical treatment, suturing ($n=45$), wound disinfection with suturing ($n=37$), and teeth extractions ($n=32$) were the most frequently performed procedures.

For conservative treatments, splinting ($n=51$), soft diet ($n=47$), and a combination of splinting and soft diet ($n=30$) were the most common forms of treatment. In terms of den-

te samo ozljede kože kod njih 68 (17,7 %). Statistička analiza nije pokazala značajnu korelaciju između vrste ozljede i demografskih varijabli kao što su spol (p -vrijednost = 0,36), godine kada se dogodila nezgoda (p -vrijednost = 0,324) i dobi (p -vrijednost = 0,266). U daljnjoj analizi utvrđeno je da su ozljede kože u kombinaciji s parodontnim lezijama bile učestalije ($n = 39$; $n = 24$), samo ozljede kože ($n = 32$; $n =$), pri čemu su najčešće promatrane vrste ozljeda u slučaju padova bile ozljede kože u kombinaciji s dentalnim lezijama ($n = 28$; $n = 13$).

Od 384 pacijenta, kod njih 314 dijagnosticirane su ozljede tkiva, kod 57 prijelomi kostiju, kod 192 ozljede parodonta, kod 176 ozljede zuba, a samo kod 5 neurološke ozljede.

Najzahaćenija mjesta bili su gornji središnji sjekutići, sa 174 ozljede zabilježene na svakom mjestu, zatim gornja usna – 96 pacijenata i donja usna – 86. Ozljede koronoidne apofize, gornjega lijevog drugog kutnjaka, donjega desnog prvog kutnjaka (zubi 27 i 46, prema klasifikaciji FDI-a – Svjetske stomatološke federacije) i frakture I, II i III prema Le Fortu nisu otkrivene. Na slikama 2. i 3. vidi se distribucija mjesta ozljeda. Najzastupljenija ozljeda na usnama bila je razderotina, a u slučaju ozljeda mekih tkiva česte su otekline i abrazija. Sve neurološke ozljede dijagnosticirane su kao hipoestezija.

Donja čeljust bila je najčešće zahvaćeno područje ($n = 20$) kad je riječ o prijelomu kostiju. Ta se distribucija nalazi u tablici 2. Što se tiče dentalnih ozljeda, nekomplikirani prijelomi krunica prevladavali su na gornjim sjekutićima.

Upravljanje traumom

Od 348 pacijenata, 218 liječeno je kirurški, 79 stomatološki, 210 konzervativno, a 278 farmakološki.

Najčešći farmakološki tretman bili su lijekovi protiv bolova ($n = 101$; 26,8 %). U kirurškome liječenju najčešći su bili zahvati šivanja ($n = 45$), dezinfekcija rane ($n = 37$) i vadeenje zuba ($n = 32$).

Najčešći oblici konzervativnog liječenja bili su ugradnja udlage ($n = 51$), mekana dijeta ($n = 47$) i kombinacija udlage i mekane dijete ($n = 30$). Kad je riječ o stomatološkim tretmanima, najčešće su bile restauracije ($n = 19$), zaštita pulpe ($n = 18$) te kombinacija restauracije i zaštite pulpe ($n = 21$).

Table 2 Distribution of bone fractures
Tablica 2. Raspodjela prijeloma kostiju

Site	Bone fracture • Prijelom kosti
Maxilla • Gornja čeljust	4
Maxillary sinus • Maksilarni sinus	4
Mandible • Donja čeljust	2
Mandibular body • Tijelo mandibule	5
Mandibular angle • Kut mandibule	5
Zygomatic arch • Zigomatski luk	3
Nasal bone • Nosna kost	16
Orbital surface • Orbitalna površina	4
Le Fort II	1
Mandibular ramus • Mandibularni nastavak	1
Mandibular condylar process • Kondilarni nastavak	6
Mandibular symphysis • Mišićni nastavak	1

tal treatments, the most frequently performed procedures were restorations (n=19), pulp protection (n=18), and a combination of restorations and pulp protection (n=21).

Length of hospital stay ranged from 0 days (n=369), 1 day (n=4), 2,4, and 5 days (n=2) and 3,6, and 12 days (n=1). Information on the hospitalization of 2 patients was not available.

Discussion

In 2020, the number of traumatic incidents was comparatively lower due to the impact of the ongoing pandemic situation, with individuals spending more time at home, thus being less exposed to potential traumatic events. This decrease in trauma incidents aligns with the reduced participation in sports activities as a result of mandatory lockdowns (32,33).

The most prevalent etiology in the current study was identified as falls, which has been supported by previous studies conducted by Mahmoodi et al. (5), Bruccoli et al. (34), Toivari et al. (35) and Guo et al. (36). Additionally, the likelihood of such injury etiology in female patients, and with increasing age, has been noted by several authors (34,36,45-48).

Several studies conducted in various European countries have revealed a rising trend of assault as the primary cause of oral maxillofacial trauma in recent years, as evidenced by references (20,33,37,45,47). Conversely, road traffic accidents have been witnessing a decline, as reported in the systematic review by Barbosa et al. (39), which highlights that Portugal has experienced a reduction in road traffic accidents since the implementation of road safety measures in 1994. These findings are in line with the results obtained in the current study. However, the study conducted by Alves La-Salette (40) in Portugal between 2001-2007 provides conflicting results. There are also other studies (3,10), which confirmed the fact that assault is a primary cause of oral maxillofacial trauma.

The present study concurs with previous research in revealing the oral and maxillofacial traumas caused by assault are more prevalent among male patients and adults, as stated in (5,35,36).

With regards to the categorization of injuries, it is important to acknowledge the scarcity of European studies that examine soft tissue and dental injuries, since majority of investigations only concentrate on fractures and their respective treatments. As per findings of Burnham et al. (38), soft tissues injuries are considered to be most ubiquitous, while Guo et al. (36) reported that lips are the most frequent of soft tissue lesions, which aligns with the results of our study. Given the fact that the lips serve as a protective barrier for the teeth, they present a considerable risk of injuries, particularly lacerations (48).

Some researchers stated that the mandible is the primary site of fractures (3,10,35,41,42), as confirmed by our research. The disparity between the incidence of fractures in the mandible and nasal bone is minimal. The peculiar shape, location, mobility, presence of unerupted third molars, and limited bone support compared to the maxilla are several of the factors that make the mandible susceptible to fracture.

Hospitalizacija se kretala se od 0 dana (n = 369), 1 dan (n = 4), 2, 4 i 5 dana (n = 2) te 3, 6 i 12 dana (n = 1). Podatci o hospitalizaciji za dva pacijenta nisu bili dostupni.

Rasprava

U 2020. broj traumatskih incidenata bio je razmjerno manji zbog utjecaja pandemije, jer su ljudi više vremena provodili kod kuće pa su zato bili manje izloženi potencijalnim traumatičnim događajima. To smanjenje traumatskih incidenata u skladu je i sa smanjenim sudjelovanjem u sportskim aktivnostima kao posljedicom obveznog zatvaranja (32, 33).

Najčešća etiologija u trenutačnoj studiji bili su padovi, što je potkrijepljeno dosadašnjim studijama koje su proveli Mahmoodi i suradnici (5), Bruccoli i suradnici (34), Toivari i suradnici (35) i Guo i suradnici (36). Dodatno, vjerojatnost takve etiologije ozljede kod pacijentica, i to s povećanjem dobi, uočilo je nekoliko autora (34, 36, 45 – 48).

U nekoliko studija provedenih u raznim europskim zemljama autori su otkrili trend porasta napada kao primarnog uzroka oralne maksilofacijalne traume u posljednjih nekoliko godina, o čemu svjedoče referencije (20, 33, 37, 45, 47). Suprotno tomu, prometne nesreće u cestovnom prometu bilježe pad, kako je navedeno u sustavnom pregledu Barbosa i suradnika (39) koji ističe da je u Portugalu smanjen broj takvih prometnih nesreća zbog provedbe mjera sigurnosti na cestama od 1994. godine. Ti su nalazi u skladu s rezultatima dobivenima u ovoj studiji. No u studiji Alvesa La-Salette (40) u Portugalu od 2001. do 2007., rezultati su proturječni. Postoje i druge studije (3, 10) u kojima je potvrđena činjenica da je napad primarni uzrok oralne maksilofacijalne traume.

Podatci iz ove studije pokazuju, kao i oni u dosadašnjim istraživanjima, da su oralne i maksilofacijalne traume prouzročene napadom češće među muškim pacijentima i odraslim osobama (5, 35, 36).

Kad je riječ o kategorizaciji ozljeda, važno je priznati da je u Europi malo studija u kojima se istražuju ozljede mekoga tkiva i zuba, zato što se većina istraživanja usredotočuje samo na prijelome i njihovo liječenje. Prema nalazima Burnhama i suradnika (38), ozljede mekih tkiva smatraju se najčešćima, a Guo i suradnici (36) navode da su na usnicama najčešće lezije mekoga tkiva, što je u skladu s rezultatima naše studije. S obzirom na to da usnice služe kao zaštitna barijera za zube, one su rizične kad je riječ o ozljedama, posebice razderotinama (48).

Neki istraživači navode da je mandibula primarno mjesto prijeloma (3, 10, 35, 41, 42), što potvrđuje i naše istraživanje. Razlika u učestalosti prijeloma mandibule i nosne kosti je minimalna. Neobičan oblik, položaj, pokretljivost, neznatni treći kutnjaci i ograničena koštana potpora u usporedbi s maksilom, nekoliko je čimbenika koji mandibulu čine osjetljivom na prijelome.

In terms of dental injuries, the upper central incisors are documented as the teeth most frequently affected by fracture (43), with uncomplicated crown fracture being the most widespread (5). This piece of information concurs with the outcomes of our study.

The study by Mahmoodi et al. (5) addresses diverse treatments applied, with an emphasis on the prevalence of restorations as dental treatment, splinting as a conservative treatment, suture as a surgical treatment, and the prescription of antibiotics as a pharmacological treatment.

In terms of the treatment options, our results mirror those obtained. However, there is a discrepancy with regards to the pharmacological treatment, where the prescription of pain medication is more prevalent in our study.

As for the most frequently applied type of treatment, the pharmacological treatment takes the lead, followed by surgical, conservative, and dental treatments. Some authors have also reported that surgical treatments are more commonly performed than conservative ones (20,46-48).

The disparity between sexes in our study is minimal, with male patients constituting 50.52% and female patients 49.48%, which is in contrast with previous studies in the field which reported the male predominance (10,20,34-37,44).

This discrepancy may be attributed to cultural variations between the populations analyzed in each study, the fact that in Portugal the difference between sexes is not as pronounced, and because the falls, which predominantly affect female patients, were the primary etiology in our study.

It is worth mentioning that the sample used in this study cannot be extrapolated to represent the entire Portuguese population, as it is a convenience sample consisting of patients from the Central Hospital of Lisbon, CHLN.

Conclusions

The significance of this investigation lies in its ability to identify etiological factors and traumatic events that contribute to oro-maxillo-facial injury evaluation.

The study found that falls or accidental descents were the most frequent causes of maxillofacial traumatic events, followed by assault. The incidence of road traffic accidents has been declining over the years, likely due to stringent road safety regulations. It was noted that male patients and adults were more commonly affected by assaults, whereas falls were more prevalent among females and elderly individuals.

The year 2020 shows a noticeable decrease in the number of injuries, which can be attributed to the pandemic situation.

The research revealed that soft tissues injuries were described as the primary type of injuries and fractures were primarily observed in the mandible and nasal bone. As for dental injuries, the upper central and lateral incisors were frequently impacted by uncomplicated crown fractures. The most commonly employed therapy was the prescription of painkillers, followed by surgical treatment.

Kad je riječ o dentalnim ozljedama, gornji središnji sjekutići najčešće su zahvaćeni prijelomom (43), a najrašireniji je nekomplikirani prijelom krunice (5). Taj se podatak slaže s rezultatima naše studije.

Studija Mahmoodija i suradnika (5) bavi se različitim primijenjenim tretmanima, s naglaskom na prevalenciji restauracija (stomatološki tretman), zatim postavljanjem udloga (konzervativni tretman), šavovima (kirurški tretman) i propisivanjem antibiotika (farmakološki tretman).

Kad je riječ o mogućnosti liječenja, naši rezultati odražavaju one dobivene u ostalim studijama. No postoji razlika u farmakološkom liječenju – propisivanje lijekova protiv bolova zastupljenije je u našem istraživanju.

Među najčešće primjenjivanim oblicima liječenja prednjači farmakološko liječenje, zatim slijede kirurško, konzervativno i stomatološko. Neki autori također su izvjestili da je kirurško liječenje češće nego konzervativno (20, 46 – 48).

Razlika među spolovima u našoj studiji je minimalna – pacijenti čine 50,52 %, a pacijentice 49,48 %, što je u suprotnosti s dosadašnjim studijama u kojima su prevladavali muškarci (10, 20, 34 – 37, 44).

To se odstupanje može pripisati kulturološkim varijacijama između populacija analiziranih u svakoj studiji i činjenici da u Portugalu razlika među spolovima nije toliko izražena i jer su padovi, koji pretežno pogađaju pacijentice, bili primarna etiologija u našoj studiji.

Valja spomenuti da se uzorak korišten u ovoj studiji ne može ekstrapolirati tako da predstavlja cjelokupnu portugalsku populaciju jer se radi o praktičnom uzorku koji se sastoji od pacijenata iz Centralne bolnice u Lisabonu.

Zaključak

Značenje ovog istraživanja jest u tomu da identificira etiološke čimbenike i traumatske događaje koji pridonose evaluaciji oromaksilofacijalne ozljede.

Studija je pokazala da su padovi ili slučajna spuštanja najčešći uzroci maksilofacijalnih traumatskih događaja, a slijedi napad. Učestalost prometnih nesreća opada tijekom godina, vjerojatno zbog strogih propisa o sigurnosti na cestama. Uočeno je da su mladići i odrasli muškarci češće sudjelovali u napadima, a padovi su bili češći među ženama i starijim osobama. U 2020. godini zabilježen je pad broja ozljeda, što se može pripisati pandemiji bolesti COVID-19.

Istraživanjem je utvrđeno da su ozljede mekih tkiva opisane kao primarni tip ozljeda, a prijelomi su uglavnom uočeni u mandibuli i nosnoj kosti. Kad je riječ o ozljedama zuba, gornji središnji i lateralni sjekutići često su bili zahvaćeni nekomplikiranim prijelomima krunica. Najčešće korištena terapija bila je propisivanje analgetika, a slijedi kirurško liječenje.

Acknowledgments

Fundação para a Ciência e a Tecnologia, no âmbito do projeto UID/MAT/00006/2020

Conflict of Interest

The authors declare no competing interests.

Ethical Approval

The study was approved by the Ethics Committee of the Hospital Santa Maria (CHLN) with the number 472/20.

Informed Consent

In this clinical retrospective study, data provided by the database of CHLN were analyzed following the STROBE recommendations and was performed in compliance with the Helsinki Declaration from October 2013.

Author's contribution: C.M.P.P. - Supervision Project; C.M.P.P., R.F.V.S.S., F.J.S.S. - Conceptualization and Methodology; C.M.P.P., A.R.S., C.R.G., V.N., F.C., F.J.S.S., R.F.V.S.S. - Validation, Investigation; R.F.V.S.S. - Formal analysis; C.M.P.P., F.J.S.S., R.F.V.S.S. - Resources; A.R.S., C.R.G., V.N. - Data curation, Writing - Original draft. C.M.P.P., R.F.V.S.S. - Writing - Reviewing and Editing.

Priznanja

Zaklada za znanost i tehnologiju za projekt pod brojem UID/MAT 00006/2020.

Sukob interesa

Autori nisu bili u sukobu interesa.

Etičko odobrenje

Studiju je odobrilo Etičko povjerenstvo bolnice Santa Maria (CHLN) pod brojem 472/20.

Informirani pristanak

U ovoj kliničkoj retrospektivnoj studiji podatci su dobiveni iz baze podataka CHLN-a te analizirani prema preporukama STROBE i provedeni u skladu s Helsinškom deklaracijom iz listopada 2013.

Doprinos autora: C. M. P. P. – nadzor projekta; C. M. P. P., R. F. V. S. S., F. J. S. S. – konceptualizacija i metodologija; C. M. P. P., A. R. S., C. R. G., V. N., F. C., F. J. S. S., R. F. V. S. S. – validacija i istraživanje; R. F. V. S. S. – formalna analiza; C. M. P. P., F. J. S. S., R. F. V. S. S. – resursi; A. R. S., C. R. G., V. N. – provjera podataka, pisanje teksta, izvorni nacrt; C. M. P. P., R. F. V. S. S. – pisanje teksta, recenziranje i uređivanje

Sažetak

Cilj: Sve veće značenje sudsko-medicinske evaluacije nakon maksilofacijalnih traumatskih događaja složeno je pitanje. Autorima ovoga kliničkoga istraživanja cilj je bio procijeniti trenutačnu etiologiju oralnih i maksilofacijalnih ozljeda u portugalskoj populaciji. **Materijal i metode:** Epidemiološka klinička opservacijska studija provedena je između 2018. i 2020. godine u Kliničkome bolničkom centru Lisabon-sjever na uzorku od 384 ispitanika s dijagnosticiranom oralnom i maksilofacijalnom traumom. Podatci su prikupljeni iz kliničkih izvješća i analizirani u SPSS verziji 27. **Rezultati:** Muški i ženski ispitanici bili su gotovo izjednačeni u broju i distribuciji – sudjelovalo je 49,5 % žena i 50,5 % muškaraca. U 2020. godini zabilježen je pad broja traumatskih incidenata u odnosu prema ostalim godinama. Ustanovljeno je da su padovi ili slučajna spuštanja najčešći uzrok ozljeda – čine 44,3 %, a slijede napadi koji čine 24,7 %. Ukupno 84 ispitanika imalo je imalo ozljede mekog tkiva u parodontnoj regiji. Gornji središnji sjekutići (174) bili su najčešće zahvaćeni kad je riječ o nekomplikiranim prijelomima, a prevladavajući oblik liječenja bili su lijekovi protiv bolova. **Zaključak:** Utvrđena je korelacija između padova ili slučajnih silazaka, ženskih subjekata i starije dobi, te između napada muških subjekata i odraslih. Padovi ili slučajni padovi i napadi bili su dominantni uzroci, a u 2020. godini smanjio se broj traumatskih događaja.

Zaprimljen: 15. srpnja 2022.

Prihvaćen: 13. veljače 2023.

Adresa za dopisivanje

Cristiana Palmela Pereira
Glavni istražitelj FORENSEMED iz
UICOB-a
Faculdade de Medicina Dentária da
Universidade de Lisboa
Rua Professora Teresa Ambrósio
Cidade Universitária
1600-003 Lisabon, Portugal

MeSH pojmovi: ozljede zuba; maksilofacijalne ozljede; forenzička stomatologija; procjena invaliditeta

Autorske ključne riječi: trauma oromaksilofacijalna; ozljede; retrospektivna studija; sudska medicina

References

- Santos P. Avaliação do dano oro-facial pós-traumático em sede de direito civil, penal e trabalho. Faculdade de Medicina Dentária da Universidade Lisboa; 2011.
- Ramos J, Almeida M, Alencar Y, de Sousa Filho L, Figueiredo C, Almeida M. Estudo epidemiológico do trauma bucomaxilofacial em um hospital de referência da Paraíba. Rev Col Bras Cir. 2018 Dec 10;45(6):e2040.
- Wusiman P, Maimaituerxun B, Guli, Saimaiti A, Moming A. Epidemiology and Pattern of Oral and Maxillofacial Trauma. J Craniofac Surg. 2020 Jul-Aug;31(5):e517-e520.
- Xiao-Dong L, Qiu-Xu W, Wei-Xian L. Epidemiological pattern of maxillofacial fractures in northern China. Medicine (Baltimore). 2020 Feb;99(9):e19299.
- Mahmoodi B, Rahimi-Nedjat R, Weusmann J, Azaripour A, Walter C, Willershausen B. Traumatic dental injuries in a university hospital: a four-year retrospective study. BMC Oral Health. 2015 Nov 4;15(1):139.
- Mosaddad S, Gheisari R, Erfani M. Oral and maxillofacial trauma in motorcyclists in an Iranian subpopulation. Dent Traumatol. 2018 Oct;34(5):347-352.
- AlHammad Z, Nusair Y, Alotaibi S, Ababtain R, Alsulami S, Aljumah G. A cross-sectional study of the prevalence and severity of maxillofacial fractures resulting from motor vehicle accidents in Riyadh, Saudi Arabia. Saudi Dent. 2020 Sep;32(6):314-320.
- Sarkarat F, Kalantar Motamedi M, Mahaseni Aghdam H, Rastegar-moghadamshalduzi H. Evaluation of Oral and Maxillofacial Traumatic Injuries at Buali Hospital of Tehran During 2008 to 2016. Trauma Monthly, 2019.
- Al-Bokhamseen M, Salma R, Al-Bodbaaj M. Patterns of maxillofacial fractures in Hofuf, Saudi Arabia: A 10-year retrospective case series. Saudi Dent J. 2019 Jan;31(1):129-136.
- Ruslin M, Brucoli M, Boffano P, Benec H, Dediol E, Uglešić V, et al. Motor vehicle accidents-related maxillofacial injuries: a multi-centre and prospective study. Oral Surg Oral Med Oral Pathol Oral Radiol. 2019 Sep;128(3):199-204.
- Farias I, Bernardino Í, Nóbrega L, Gempel R, Davila S. Maxillofacial trauma, etiology and profile of patients: An exploratory study. Acta Ortop Bras. 2017 Nov-Dec;25(6):258-261.
- Al-Iryani G, Alharbi F, Makrami A, Maghdi A. Patterns and Etiolo-

- gy of Maxillofacial Fractures: A 5-Year Retrospective Study. *J Contemp Dent Pract.* 2020 Apr 1;21(4):445-452.
13. Subramanian A, Niazi T, Diana C, Pughalaendhi N, Gurunathan U, Kathiresan N. Prevalence and pattern of adult maxillofacial injuries: An institution-based retrospective study. *Journal of Pharmacy and Bioallied Sciences,* 12(5):472, 2020.
 14. Conceição L, da Silveira I, Nascimento G, Lund R, da Silva R, Leite F. Epidemiology and Risk Factors of Maxillofacial Injuries in Brazil, a 5-year Retrospective Study. *J Maxillofac Oral Surg.* 2018 Jun;17(2):169-174.
 15. Teshome A, Andualem G, Tsegie R, Seifu S. Two years retrospective study of maxillofacial trauma at a tertiary center in North West Ethiopia. *BMC Res Notes.* 2017 Aug 8;10(1):373.
 16. Emodi O, Wolff A, Srouji H, Bahouth H, Noy D, Abu El Naaj I, et al. Trend and Demographic Characteristics of Maxillofacial Fractures in Level I Trauma Center. *J Craniofac Surg.* 2018 Mar;29(2):471-475.
 17. Amarista Rojas F, Bordoy Soto M, Cachazo M, Dopazo J, Vélez H. The epidemiology of mandibular fractures in Caracas, Venezuela: Incidence and its combination patterns. *Dent Traumatol.* 2017 Dec;33(6):427-432.
 18. Ramos J, Almeida M, Alencar Y, de Sousa Filho L, Figueiredo C, Almeida M. Estudo epidemiológico do trauma bucomaxilofacial em um hospital de referência da Paraíba. *Rev Col Bras Cir.* 2018 Dec 10;45(6):e2040.
 19. Abosadegh M, Saddki N, Al-Tayar B, Rahman S. Epidemiology of Maxillofacial Fractures at a Teaching Hospital in Malaysia: A Retrospective Study. *Biomed Res Int.* 2019 Feb 13;2019:9024763.
 20. Goedecke M, Thiem D, Schneider D, Frerich B, Kämmerer P. Through the ages - Aetiological changes in maxillofacial trauma. *Dent Traumatol.* 2019 Apr;35(2):115-120.
 21. Dhungel S, Singh A. Prevalence of Operated Facial Injury in the Department of Oral and Maxillofacial Surgery of a Tertiary Hospital. *JNMA J Nepal Med Assoc.* 2020 Jan;58(221):6-10.
 22. Razia S. Causes of Maxillofacial Injuries in Patients Reporting at Liaquat University Hospital Hyderabad. *Journal of Liaquat University of Medical & Health Sciences.* 2017;16(01):17-19.
 23. Passi D, Chandra L, Deepa D, Atri M, Pandey S, Goyal J, et al. A retrospective cross-sectional study of maxillofacial trauma in Delhi-NCR Region. *J Family Med Prim Care.* 2019 Apr;8(4):1453-1459.
 24. Aleksanyan L, Poghosyan A. Epidemiology of Maxillofacial Injuries in "Heratsi" No 1 University Hospital in Yerevan, Armenia: A Retrospective Study, 2021. *BMC Oral Health.* 2022 Apr 12;22(1):123.
 25. Aslam F, Maqsood A, Asim MA, Abbasi S, Muzzafar A. Association of maxillofacial injuries with their etiological factors, a retrospective analysis. *Isra Med J.* 2019;11(2): 101-105.
 26. Gupta A, Babu A, Bansal P, Sharma R, Sharma S. Changing trends in maxillofacial trauma: A 15 years retrospective study in the Southern Part of Haryana, India. *Indian J Dent Res.* 2018 Mar-Apr;29(2):190-195.
 27. Jindwani K, Markam HS, Paharia YK, Singh K. Maxillofacial Fractures: Etiology, incidence, Pattern and Treatment of Maxillofacial Injuries in a Government Medical College of Central India. *J Adv Med Dent Scie Res.* 2018;6(3):101-106.
 28. Patil S. Associated injuries in maxillofacial trauma — a study in a tertiary hospital. *J Maxillofac Oral Surg.* 2018 Dec;17(4):410-416.
 29. Syed K. Maxillofacial Injuries Due to Road Traffic Accidents in Saudi Arabia: A Review of Incidence, Demographic Factors & Prevention Strategies. *International Journal of Medical and Dental Sciences.* 2017;6(1):1386.
 30. Elarabi M, Bataineh A. Changing pattern and etiology of maxillofacial fractures during the civil uprising in Western Libya. *Med Oral Patol Oral Cir Bucal.* 2018 Nov 1;23(6):e716-e722.
 31. Gurung U, Singh G, Mishra M, Mondal S, Gaur A. Maxillofacial Injuries Related to Road Traffic Accidents: A Five Year Multi Center Analysis. *Craniofacial Trauma & Reconstruction Open.* 2019;3(1):s-0039-1694708.
 32. Vishal, Prakash O, Rohit, Prajapati V, Shahi A, Khaitan T. Incidence of Maxillofacial Trauma Amid COVID-19: A Comparative Study. *J Maxillofac Oral Surg.* 2022 Jun;21(2):420-425.
 33. De Boutray M, Kün-Darbois J, Sigaux N, Lutz J, Veyssié A, Sesque A, et al. Impact of the COVID-19 lockdown on the epidemiology of maxillofacial trauma activity: A French multicentre comparative study. *Int J Oral Maxillofac Surg.* 2021 Jun;50(6):750-755.
 34. Bruccoli M, Boffano P, Romeo I, Corio C, Benec A, Ruslin M, et al. Epidemiology of maxillofacial trauma in the elderly: A European multicenter study. *J Stomatol Oral Maxillofac Surg.* 2020 Sep;121(4):330-338. doi: 10.1016/j.jormas.2019.09.002. Epub 2019 Sep 15.
 35. Toivari M, Snäll J, Suominen A, Apajalahti S, Lindqvist C, Thorén H. Associated Injuries Are Frequent and Severe Among Geriatric Patients with Zygomatico-Orbital Fractures. *J Oral Maxillofac Surg.* 2019 Mar;77(3):565-570.
 36. Guo HQ, Yang X, Wang XT, Li S, Ji AP, Bai J. Epidemiology of maxillofacial soft tissue injuries in an oral emergency department in Beijing: A two-year retrospective study. *Dent Traumatol.* 2021 Jun;37(3):479-487.
 37. Nuñez J, Sallent A, Lakhani K, Guerra-Farfan E, Vidal N, Ekhtiari S, et al. Impact of the COVID-19 Pandemic on an Emergency Traumatology Service: Experience at a Tertiary Trauma Centre in Spain. *Injury.* 2020 Jul;51(7):1414-1418.
 38. Burnham R, Martin T. Maxillofacial injuries in the workplace. *Br J Oral Maxillofac Surg.* 2013 Apr;51(3):253-5.
 39. Barbosa K, de Macedo Bernardino Í, d'Ávila S, Ferreira E, Ferreira R. Systematic review and meta-analysis to determine the proportion of maxillofacial trauma resulting from different etiologies among children and adolescents. *Oral Maxillofac Surg.* 2017 Jun;21(2):131-145.
 40. Alves L, Aragão I, Sousa M, Gomes E. Pattern of Maxillofacial Fractures in Severe Multiple Trauma Patients: A 7-year Prospective Study. *Braz Dent J.* 2014 Nov-Dec;25(6):561-4.
 41. AlQahtani F, Bishawi K, Jaber M. Analysis of the pattern of maxillofacial injuries in Saudi Arabia: A systematic review. *Saudi Dent J.* 2020 Feb;32(2):61-67.
 42. Al-Qahtani F, Bishawi K, Jaber M, Thomas S. Maxillofacial trauma in the gulf countries: a systematic review. *Eur J Trauma Emerg Surg.* 2021 Apr;47(2):397-406.
 43. Døving M, Galteland P, Eken T, Sehic A, Utheim T, Skaga N, et al. Dentoalveolar injuries, bicycling accidents and helmet use in patients referred to a Norwegian Trauma Centre: A 12-year prospective study. *Dent Traumatol.* 2021 Apr;37(2):240-246.
 44. Loutroukis T, Loutrouki E, Klukowska-Rötzler J, Koba S, Schlittler F, Schaller B, et al. Violence as the Most Frequent Cause of Oral and Maxillofacial Injuries among the Patients from Low- and Middle-Income Countries—A Retrospective Study at a Level I Trauma University Emergency Department in Switzerland. *Int J Environ Res Public Health.* 2020 Jul 7;17(13):4906
 45. Škrinjarčić T, Čuković-Bagić I, Goršeta K, Verzak Ž, Škrinjarčić I. Socioeconomic Status and Dental Injury Repetition in Children. *Acta stomatol Croat.* 2013;47(2):154-162.
 46. Ivkošić I, Gavić L, Jerković D, Macan D, Vladislavić NZ, Galić N, et al. Knowledge and Attitudes about Dental Trauma Among the Students of the University of Split. *Acta stomatol Croat.* 2020;54(3):302-313.
 47. Haliti F, Jurić H. The Relationship Between Dental Trauma, Anxiety and Aggression Behavior in 7 to 14 Year Old Children in Kosovo. *Acta Stomatol Croat.* 2017 Mar;51(1):3-12.
 48. Sen-Yavuz B, Sadikoglu S, Sezer B, Toumba J, Kargul B. An Assessment of the Knowledge of Dentists on the Emergency Management of Avulsed Teeth. *Acta Stomatol Croat.* 2020 Jun;54(2):136-146.