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EXTENDED ABSTRACT

Analysis of the pattern of Oral and Maxillofacial Trauma in the world: A Systematic Review and Meta-Analysis

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Introduction

Trauma is defined as an unexpected event beyond the victim's control, constituting one of the greatest health concerns worldwide [1-22]. In the event of a traumatic situation, this can culminate in the full recovery, in the presence of a temporary injury or a sequelae [23, 24].

These lesions can occur in any part of the body, and in this case, their focus will be at the oral maxillofacial level, following the classification of Andreasen for the teeth [25, 26].

Oral maxillofacial trauma represents between 7.4 to 8.7% of medical emergencies, both in developed and developing countries [27-29]. Their causes differ from country to country, depending on culture, socioeconomic level, and environmental factors [3-5, 12, 30-53], the main causes being road accidents, falls and aggression.

Understanding the epidemiology of oral and maxillofacial trauma is essential to shape public health policy and adequate better tables for disabilities evaluation. Therefore, the aim of this study was to investigate the epidemiological characteristics of oral maxillofacial trauma, namely to analyze the following features:

- Probabilities of attaining each type of oral and maxillofacial trauma by etiology.
- Descriptive statistics on age and sex distribution within the different types of oral and maxillofacial traumas.
- Association between oral and maxillofacial trauma type, sequelae's, etiology, age and gender.

Methods

Protocol and registration

In carrying out this systematic review, the guidelines of the PRISMA recommendations (Preferred Reporting Items for Systematic Reviews and Meta-analyses) were followed. The protocol was registered in the PROSPERO database (International Prospective Register of Systematic Review).

Information sources and search strategy

In this study, the following databases were searched: PubMed/MEDLINE and SCOPUS between the years 2010 and 2020 with Mandarin language restriction. This study included individuals aged 21 years or older who had trauma in the oral maxillofacial region. Moreover, no restriction regarding the type of study (retrospective or prospective) were considered. Letters to the editor and studies on subjects that have injuries caused by military service were excluded.

The Medical Subject Headings (MeSH) terms selected for the purposes of this search included 'oral maxillofacial', 'trauma', 'accident' and 'injuries', and include all possible combinations.

Subsequently, we used the PICO framework, Population (adults with oral maxillofacial injuries), Exposure (etiology of oral maxillofacial trauma), Comparison (different countries on different emergency services) and Outcome (association between etiology, age, sex and type of trauma).

Quality of the studies

The Joanna Briggs Institute Checklist for Prevalence Studies was used to assess the risk of bias in all identified and collected full text articles included in this study. Moreover, GRADE (Grading of Recommendations, Assessment, Development, and Evaluation) method was applied to assess the quality of the

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evidence. After confirming the quality of each study, 2 authors independently extracted the data to the pre-specified data extraction sheet in Microsoft Excel.

Results

The review search process yielded 404 articles. Of these, 16 were duplicated. Therefore, 388 articles were screened by titles and abstracts evaluation, 5 due to discrepancies in the results, and only 78 articles were included (Figure 1).

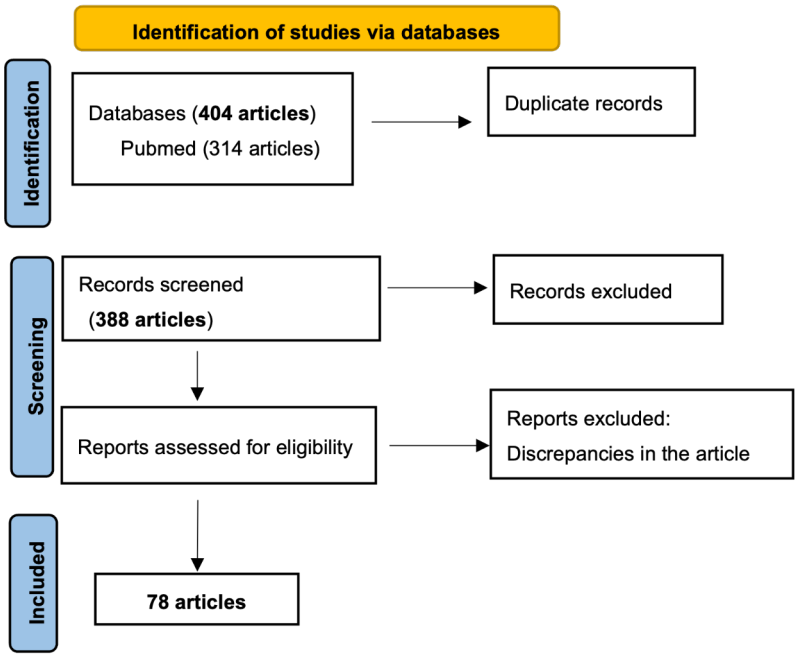

Figure 1 - Prisma flow diagram (studies included).

Dental injuries were reported in 26 studies, fractures were described in 67 and only 31 articles present information on soft tissue injury.

Through the random effects model, it was concluded that the main cause of trauma was road traffic accidents with a prevalence of 55.37%, followed by assault with 17.56% and falls with 10.21% (Fig. 2).

By performing a meta-regression, it was possible to establish an association between assaults and males at Africa (p-value <0.001). Falls increase with age and usually occur in women and in the European and Muslin countries (p-value <0.001). The frequency of road traffic accidents is higher in Asia (p-value between 0.01 and 0.05) and lower in Europe.

The most frequent type of injuries is fractures with a prevalence of 84.30% (Fig. 3), followed by soft tissues injuries, 52.11%. Dental injuries represent 25.41% and a statistical association has been made between these injuries, young ages and Europe and Asia (p-value <0.001).

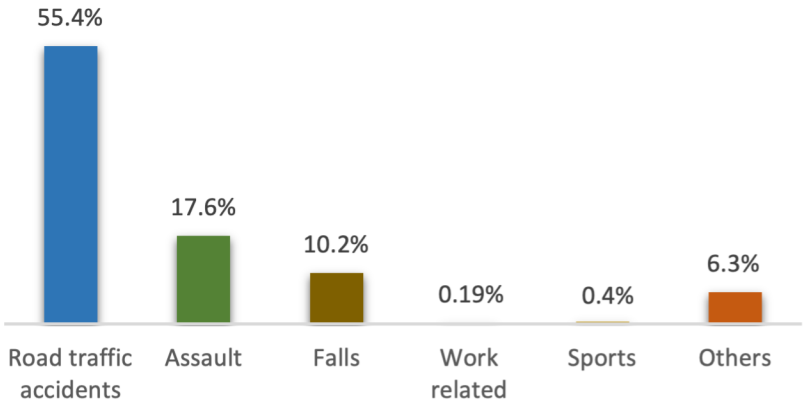

Figure 2 - Etiology of trauma

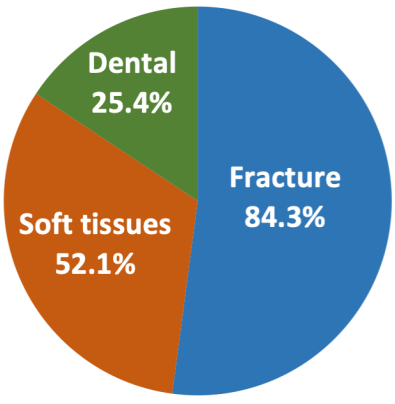

Figure 3 - Types of trauma

Discussion:

The main etiology differs from country to country, being influenced by culture, social environment and laws. The results regarding the road traffic accidents being the most frequent cause of trauma corroborate the literature [15, 54-59]. This findings can be explained by the lack of safety measures or negligence in complying with them, the poor quality of the roads and aggressive driving [15, 54, 56-59].

Assault is more usual [56, 59] in the European and Latin America countries, while the falls are more frequent in Europe [57, 59].

The systematic reviews of Al Qahtani et al. [56, 57] and Boffano et al. [15] show that falls are more frequent in elderly people and Chrcanovic [59] reveal that females are more likely to fall. These studies are in agreement with the obtained results.

Despite the fact of the male/female ratio between the studies being quite discrepant, we can observe a higher number of males, which is corroborated by several authors [55-59].

As for the type of injury, the prevalence of fractures is significant [56-59], although few systematic reviews address the different types of injuries.

Our study has some limitations, one of them is the high heterogeneity, which can be explained by the different sample sizes and the fact that the majority of the studies are observational.

Conclusion:

Based on the results of our review, it was concluded that road traffic accidents are the main etiology of oral maxillofacial trauma and special attention should be given to Asia, which presented the highest prevalence. Assault is also a main cause of trauma, being more frequent in males, while falls were more evident in European countries, females and with aging.

Regarding the type of trauma, fractures were the main type and dental injuries are frequent seen in young people and Europa/Asia.

Ethics committee and informed consent:

Study performed was approved and realized in accordance with the ethical standards specified by the Health Ethics Committee of the Faculty of Dental Medicine, University of Lisbon, Lisbon, Portugal

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