UNIVERSIDADE ESTADUAL DE CAMPINAS
FACULDADE DE ODONTOLOGIA DE PIRACICABA

THIAGO BRITO XAVIER

EXISTE CORRELAÇÃO ENTRE A ESCALA DE GRAVIDADE DE FISS E TRISS SpO2 EM CRIANÇAS E ADOLESCENTES VÍTIMAS DE ACIDENTES DE TRÂNSITO?

IS THERE ANY CORRELATION BETWEEN FISS AND TRISS SpO2 SEVERITY SCALE IN CHILDREN AND ADOLESCENTS' VICTIMS OF TRAFFIC ACCIDENTS?

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Tese apresentada à Faculdade de Odontologia de Piracicaba da Universidade Estadual de Campinas como parte dos requisitos exigidos para obtenção de título de Doutor em Estomatopatologia, na Área de Estomatologia.

Thesis presented to Piracicaba Dental School of the University of Campinas in partial fulfillment of the requirements for the degree of Doctor in Stomatopathology, in Stomatology area.

ORIENTADOR: PROF. DR. HELDER ANTONIO REBÊLO PONTES

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RESUMO

Background: As escalas de severidades quantificam a probabilidade de sobrevivência da gravidade do trauma. A correlação entre as escalas de gravidade de lesão facial (FISS) e de severidade do trauma corporal geral (TRISS SpO2) em crianças e adolescentes vítimas de acidente de tráfego, corrobora com melhor precisão da verificação da gravidade, mortalidade do trauma e perfil epidemiológico padronizado de grande importância no atendimento de urgência. Este estudo tem como objetivo avaliar a possível correlação entre o FISS e TRISS SpO2 para trauma facial em crianças e adolescentes vítimas de acidentes de trânsito, e as características associadas a cada escala, em um hospital de urgência e emergência de referência no norte do Brasil. **Método:** Este estudo observacional retrospectivo transversal, incluiu 330 crianças e adolescentes (0 à 19 anos), vítimas de acidentes de tráfego com fratura facial. As médias e percentagens foram apresentadas como estatística descritiva com o teste de Kolmogorov-Smirnov sendo realizado para avaliar a normalidade das variáveis. Para a análise dos grupos independentes foram utilizados o teste t de Student ou o teste de Mann-Whitney. Além dos testes qui-quadrado de Pearson ou exato de Fisher que foram usados para as variáveis categóricas. **Resultados:** A relação entre médias de FISS e TRISS SpO2 mostrou estabilidade de TRISS SpO2 com média de 0,175 quando o FISS está abaixo de 16 e aumento com valor médio de 0,380 com FISS entre 16 e 18. Em relação ao nível de significância, observou-se associação elevada no TRISS SPo2 no sexo femininos de 0-4 anos de idade nos atropelamentos ($p=0,0002$), masculino de 5-9 nos acidentes de carro ($p<0,0001$), feminino de 10-14 nos acidentes motociclístico ($p<0,0001$) e homens de 15-19 nos acidentes marítimos ($p<0,0001$). Já no FISS temos no sexo feminino de 0-4 nos acidentes automobilísticos ($p<0,0001$), masculino de 5-9 nos acidentes marítimos ($p=0,0007$), masculino de 10-14 nos acidentes marítimos ($p<0,0001$) e masculino de 15-19 nos acidentes ciclísticos ($p<0,0001$). **Conclusão:** A correlação das escalas FISS e TRISS SpO2 em crianças e adolescentes vítimas de trauma de face em acidentes de tráfego se mostrou eficiente, na determinação mais precisa da severidade do trauma.

Palavras-Chave: Escala de Gravidade do Ferimento. Medicina de Emergência Pediátrica. Traumatismos Faciais. Pronto Socorro Hospitalar.

ABSTRACT

Background: Severity scales quantify the probability of survival from the trauma´s severity. The correlation between the facial injury severity scales (FISS) and the severity of general body trauma (TRISS SpO2) in children and adolescents victims of traffic accidents, corroborates with better accuracy of the verification of severity, trauma mortality and standardized epidemiological profile. of great importance in emergency care. This study aims to evaluate the possible correlation between FISS and TRISS SpO2 for facial trauma in children and adolescents victims of traffic accidents, and the characteristics associated with each scale, in a reference urgent and emergency hospital in northern Brazil. **Method:** This cross-sectional, retrospective observational study included 330 children and adolescents (0 to 19 years old), victims of traffic accidents with facial fractures. Means and percentages were presented as descriptive statistics with the Kolmogorov-Smirnov test being performed to assess the normality of the variables. For the analysis of the independent groups, the Student's t test or the Mann-Whitney test were used. In addition to Pearson's chi-square or Fisher's exact tests that were used for AS categorical variables. **Results:** The relationship between means of FISS and TRISS SpO2 showed stability of TRISS SpO2 with a mean of 0.175 when the FISS is below 16 and an increase with a mean value of 0.380 with FISS between 16 and 18. Regarding the level of significance, an association was observed high in TRISS SPo2 in females 0-4 years of age in pedestrian accidents ($p=0.0002$), males of 5-9 in car accidents ($p<0.0001$), females of 10-14 in motorcycle accidents ($p<0.0001$) and men aged 15-19 in maritime accidents ($p<0.0001$). In the FISS we have females from 0-4 in car accidents ($p<0.0001$), males from 5-9 in maritime accidents ($p=0.0007$), males from 10-14 in maritime accidents ($p<0.0001$) and male 15-19 in cycling accidents ($p<0.0001$). **Conclusion:** The correlation of the FISS and TRISS SpO2 scales in children and adolescents victims of facial trauma in traffic accidents proved to be efficient, in the most accurate determination of the severity of the trauma.

Key words: Injury Severity Score. Pediatric Emergency Medicine. Facial Injuries. Emergency Service Hospital.

SUMÁRIO

1. INTRODUÇÃO

As lesões provenientes de trauma estão entre as principais causas de morte em todas as idades em países de baixa, média e de alta renda, representam cerca de 9% de todas as mortes em todo o mundo e mais de dois terços são não intencionais por natureza(Alonge *et al.*, 2021). Pela dificuldade de comunicação e por estarem em percurso de desenvolvimento psicomotor o tratamento em jovens tem necessidade de atuação diferenciada e de forma mais rápida(Guo *et al.*, 2021; Hirobe *et al.*, 2021a; Joachim *et al.*, 2018). Nesta população, mesmo em número menor quando comparadas outras faixas etárias(Boffano *et al.*, 2015; Macedo Bernardino, de *et al.*, 2018; Srinivas *et al.*, 2021; Tashakkori, Unkel e Berry, 2021; Yesantharao *et al.*, 2021). Além de um grande número de causas pode estar associado à acidentes de tráfico que geram lesões múltiplas levando a incapacidade(AlAli *et al.*, 2021; Bilgen, Ural e Bekerecioğlu, 2019; Boffano *et al.*, 2015; Goedecke *et al.*, 2019; Guo *et al.*, 2021; Ilyas *et al.*, 2021; Khan *et al.*, 2019).

As diferenças na fisiologia em crianças e adolescentes não são as mesmas que em adultos. Assim, em um trauma, necessitam de um sistema de pontuação de severidade com mais precisão e de forma mais global(Keskey *et al.*, 2021). Vários sistemas de escalas foram desenvolvidos ao longo dos anos para mensurar a severidade e mortalidade em traumas, sempre baseado em características das mudanças sistêmicas e morfológicas apresentadas, como Escala de Coma de Glasgow (ECG), Pressão Sistólica Sistêmica (PSS) e Frequência Respiratória (FR), padronizando a internação, melhorando o tratamento e prevenindo danos irreversíveis (Lin *et al.*, 2021; Verlag *et al.*, 2003).

A inadequação na avaliação da gravidade de lesões não fatais contribui ainda mais para a subestimação de dados e de subtratamento. O *Injury Severity Score* (ISS), desenvolvido principalmente para avaliar a severidade, é a medida sumária padrão do trauma humano, Baker e colaboradores propuseram em 1974 sua criação, baseado na *Abbreviated Injury Scale* (AIS), é um sistema de pontuação anatômico, determina a gravidade do trauma em três partes do corpo mais gravemente traumatizadas. Além de sua larga utilização em hospitais de urgência e emergência nos pacientes politraumatizados, ajudando nos protocolos de atendimento e tratamento, possibilitando resultados mais satisfatórios e com menor progressão de sequelas(Alonge *et al.*, 2021; Baker *et al.*, 1974; Osler, Baker e Long, 1997)

Outras escalas surgiram para aprimorar esse sistema de escalas como o *Trauma and Injury Severity Score* (TRISS)(Boyd, Tolson e Copes, 1987), e delas saíram outras com ajustes mais detalhados para que reproduzisse mais fielmente a severidade presente no trauma(Bagheri

et al., 2006; Lin *et al.*, 2021). Uma dessas verificou que a FR em pacientes com respiradores mecânicos se torna falha e incluiu o *Peripheral Oxygen Saturation* (SpO_2), isso tornou possível a mensuração sem esse fator limitante, mais rápida, fácil e sem divergências de técnicas para obtenção do valor, essa escala foi chamada de *Trauma and Injury Severity Score Peripheral Oxygen Saturation* (TRISS SpO_2)(Domingues *et al.*, 2018).

O trauma facial, além de poder levar a uma severidade de ameaçar a vida diretamente do indivívuo, pode também levar a complicações no tratamento e consequencias negativas com danos irreparáveis aos tecidos, recuperar estruturas e estética envolvida. Os sistemas gerais de escalas são insuficientes para refletir as peculiaridades deste tipo trauma e seu desfecho. Assim, outros métodos de escalas de severidade são utilizadas para observar apenas essa região maxilofacial em específico, como o *Facial Injury Severity Scale* (FISS), mostrado na Figura 1, que é amplamente utilizado para classificar a gravidade das lesões maxilofaciais, verificando escores numéricos para fraturas em todas as regiões da face, bem como lacerações(Gai Aita *et al.*, 2018; Magee *et al.*, 2021; Zhang *et al.*, 2006).

Figura 1: Pontuação individual do paciente com fratura facial na escala de severidade FISS.

Mandible	
Dento Alveolar	1 point
Each fracture of body/ramus/symphysis	2 points
Each fracture: condyle/coronoid	1 point
Mid-face	
Each midfacial fracture is assigned one point, unless part of a complex	
Dento Alveolar	1 point
Le Fort I	2 points
Le Fort II	4 points
Le Fort III	6 points
(Unilateral Le Fort fractures are assigned half the numeric value)	
Naso-Orbital Ethmoid (NOE)	3 points
Zygomatico Maxillary Complex (ZMC)	1 point
Nasal	1 point
Upper face	
Orbital roof/rim	1 point
Displaced frontal sinus/bone fractures	5 points
Non-displaced fractures	1 point
Facial laceration	
Over 10 cm long	1 point

O completo manejo de pacientes com politraumatismo e alta complexidade requer uma padronização de classificação de forma abrangente, mensurável, validada e reprodutível(Lin *et al.*, 2020a). O calculo das escalas resultam muitas das vezes em discrepâncias em que há casos em que uma pontuação mais baixa pode resultar em maior mortalidade associada. Além do que

as escalas normalmente não levam em consideração a idade do paciente, gênero e etiologia. Por exemplo a violência interpessoal, acidentes de trânsito, quedas e lesões esportivas, com alguns países mostrando que os acidentes de trânsito são a principal causa de fraturas da face Além de se buscar alternativas para essas questões, nenhuma métrica foi totalmente aceita para substituir as já existentes, devendo-se buscar as variações necessárias para determinação destas variáveis(Keskey *et al.*, 2021; Reppucci *et al.*, 2022; Zaleckas *et al.*, 2015).

Outro fator de grande relevância são que poucos estudos levam em consideração os fatores que influenciam a hospitalização de longo prazo de lesões maxilofaciais e as características que determinam e contribuem para o tempo de hospitalização. Este entendimento busca medidas para prevenção e melhoria no tratamento visando melhor recuperação e menor tempo de hospitalização (Hirobe *et al.*, 2021b).

Este estudo tem como objetivo avaliar a possível correlação entre as escalas FISS e TRISS SpO2 no trauma facial em crianças e adolescentes vítimas de acidentes de trânsito. Além das características associadas dentro de cada escala em um hospital de referência de urgência e emergência do norte do Brasil.

2. ARTIGO

Artigo submetido ao periódico *The Journal of Trauma and Acute Care Surgery*

IS THERE ANY CORRELATION BETWEEN FISS AND TRISS SpO2 SEVERITY SCALE IN CHILDREN AND ADOLESCENTS' VICTIMS OF TRAFFIC ACCIDENTS?

Running Title: CORRELATION BETWEEN FISS AND TRISS SpO_2

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AUTHOR CONTRIBUTION

TBX: literature search, study design, data collection and, writing.

CLSM: data collection, writing and, data interpretation.

JGRL: data collection, literature search and, writing.

LLS: study design, data analysis and, data interpretation.

DPF: data collection and, writing.

DVM: data collection and, data analysis.

MSM: data collection and, critical review.

NCN: data collection and, critical review.

HARP: study design, writing and, critical review

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ABSTRACT

Background

Correlation between the Facial Injury Severity Scale (FISS) and the Trauma Injury Severity Scale peripheral oxygen saturation (TRISS SpO_2) in child and adolescent victims of traffic accidents corroborates with better accuracy the verification of severity, trauma mortality and the standardized epidemiological profile, which are of great importance in emergency care.

Method

This cross-sectional, retrospective observational study included 330 child and adolescent (age 0–19 years) victims of traffic accidents with facial fractures. Means and percentages were presented as descriptive statistics, using the Kolmogorov-Smirnov test to assess the normality of the variables. For analysis of independent groups, Student's *t*-test or the Mann-Whitney test was used. Furthermore, Pearson's chi-square and Fisher's exact tests were used for categorical variables.

Results

The relationship between the FISS and TRISS SpO_2 showed stability of the TRISS SpO_2 with a mean value of 0.175 when the FISS score is below 16 but an increase to 0.380 when the FISS score is between 16 and 18. Regarding the level of significance, an association was observed with high TRISS SpO_2 for females aged 0–4 years in pedestrian accidents ($p = 0.0002$), males aged 5–9 years in car accidents ($p < 0.0001$), females aged 10–14 years in motorcycle accidents ($p < 0.0001$) and males aged 15–19 years in maritime accidents ($p < 0.0001$). With the FISS, we have significance for females aged 0–4 years in car accidents ($p < 0.0001$), males aged 5–9 years in maritime accidents ($p = 0.0007$), males aged 10–14 years in maritime accidents ($p < 0.0001$) and males aged 15–19 years in cycling accidents ($p < 0.0001$).

Conclusion

Correlation of the FISS and TRISS SpO_2 in child and adolescent victims of facial trauma in traffic accidents proved to be efficient and the most accurate determination of trauma severity.

Level of evidence

Level III retrospective observational study.

Keywords: injury severity score; paediatric emergency medicine; facial injuries; emergency service hospital.

INTRODUCTION

In the paediatric population, a high number of factors may be associated with mortality, disability and multiple injuries. In this regard, maxillofacial and cranioencephalic injuries have a significant influence, among which traffic accidents are the most common cause, representing 34.2–57.8% of all cases(Boffano *et al.*, 2015; Macedo Bernardino, de *et al.*, 2018; Srinivas *et al.*, 2021; Tashakkori, Unkel e Berry, 2021; Yesantharao *et al.*, 2021). Such accidents are commonly associated with recklessness and disobeying the local traffic laws(AlAli *et al.*, 2021; Khan *et al.*, 2019).

To better define the standard summary measure of human trauma, Baker and collaborators in 1974 proposed the creation of the Injury Severity Score (ISS) based on the Abbreviated Injury Scale(Baker *et al.*, 1974; Osler, Baker e Long, 1997). Some methods, such as the Trauma and Injury Severity Scale (TRISS)(Boyd, Tolson e Copes, 1987)offered changes using characteristics such as age, the Glasgow Coma Scale (GCS), systolic systemic pressure (SSP) and respiratory rate to quantify the probability of survival following the consequences of the trauma severity. Thus, assigning a numerical score that provides a standardized epidemiological profile is of great importance for decisions regarding hospitalization, for improving the proper treatment of injuries and concomitant complications and for preventing irreversible damage(Lin *et al.*, 2021; Verlag *et al.*, 2003).

Previous studies performed some adjustments to the TRISS to improve its accuracy(Bagheri *et al.*, 2006; Lin *et al.*, 2021). One of these was the TRISS peripheral oxygen saturation (TRISS SpO_2), which in emergency situations allows the quality of tissue perfusion in trauma patients to be assessed more quickly and measured more easily compared to the respiratory rate(Domingues *et al.*, 2018). In addition, more specifically in the maxillofacial region, the Facial Injury Severity Scale (FISS) is widely used for classifying the severity of

facial injuries, verifying numerical scores for fractures and lacerations in all regions of the face(Gai Aita *et al.*, 2018; Magee *et al.*, 2021).

Facial fractures in young people are proportionally rare (5–15%) compared with adults(AlAli *et al.*, 2021; Bilgen, Ural e Bekerecioğlu, 2019; Boffano *et al.*, 2015; Goedecke *et al.*, 2019; Guo *et al.*, 2021; Ilyas *et al.*, 2021; Khan *et al.*, 2019). However, the singularities of this age group make the treatment a challenge due to the difficulty of the youngest to express their symptoms, as well as the influence on anatomical development and the psychosocial influences that trauma causes(Guo *et al.*, 2021; Hirobe *et al.*, 2021a; Joachim *et al.*, 2018).

Although an efficient scale has been established to measure patient trauma, it is not possible to accurately determine the severity in paediatric patients. Thus, it is necessary to establish a better measure for more accurate verification of the trauma severity and mortality in paediatric patients(Keskey *et al.*, 2021; Reppucci *et al.*, 2022). This study aims to evaluate the possible correlation between the FISS and TRISS SpO_2 for facial trauma in child and adolescent victims of traffic accidents, and the characteristics associated with each scale, in a referral urgency and emergency hospital in the north of Brazil.

MATERIALS AND METHODS

Study design

A cross-sectional retrospective observational study was carried out based on an analysis of medical records of cases involving oral and maxillofacial trauma in a referral urgency and emergency hospital in the north of Brazil. The presented institution receives high complexity trauma, meeting the demands of one of the main cities in the region and supporting 75 neighbouring cities, covering a population of more than 5 .5 million people. The study was carried out in accordance with the STROBE (Strengthening the Reporting of Observational

Studies in Epidemiology) guidelines(Elm, von *et al.*, [s.d.]) Fracture establishment was determined by computed tomography scan and three-dimensional reconstruction.

Eligibility criteria

Data from medical records of patients aged 0–19 years with maxillofacial traumas and aetiology strictly related to traffic accidents from January 2014 to December 2019 were included. This study defines the group ages according to the World Health Organization (WHO): 0–4 years, early childhood; 5–9 years, late childhood; 10–14 years, early adolescent; 15–19 years, late adolescent(World Health Organization, 1986). Inconsistent, incomprehensible or incomplete records were excluded. Fractures involving only teeth and soft lacerations, but no facial bones, were also excluded.

Data collection

Data regarding age, gender, bone fracture [temporal/frontal bone, orbital, zygomatic complex, naso-orbital-ethmoid complex, nasal bone, maxilla and mandible (including fractures of the symphysis, body, angle, ramus, coronoid, extra-articular condyle and intra-articular condyle)], traffic trauma aetiology (motorcycle, car, cycling, maritime, pedestrian and animal riding accidents), affected facial third (upper, middle and lower), comorbidities, oral and maxillofacial department hospitalization days (OMHD) and general hospitalization days (GHD), FISS, TRISS SpO_2, treatment, concomitant injuries, follow-up and mortality during hospitalization.

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Ethical approval

The Ethics Committee of approved the realization of the present study (CAAE 34572820.3.0000.0018).

Severity scales

The FISS is a numerical scale that measures the severity of maxillofacial bone injuries by considering the patient's individual fracture pattern. The scale divides the face into three horizontal thirds (mandible, middle face and upper face) and also incorporates the sum of the size of all lacerations on the face. The score is obtained by the sum of each fracture, and the total sum predicts the hospital length of stay and recovery. The scale assists the communication between clinicians and health professionals in surgical planning as a tool for researching maxillofacial injuries(Bagheri *et al.,* 2006). Among the scales presented in previous studies, the FISS is considered to be the most reliable and specific for facial trauma (Kelton *et al.,* 2021).

The TRISS SpO_2 offers an accurate and personalized standard approach for assessing trauma care outcome using the original TRISS variation with adjusted coefficients. anatomical, physiological and age characteristics are used to quantify the probability of survival in relation to the severity of the injury. The values obtained are based on the data for age, the GCS, SpO_2, *SSP and* ISS(Boyd, Tolson e Copes, 1987; Domingues *et al.*, 2018).

Statistical analysis

Means and percentages are presented as descriptive statistics. The Kolmogorov-Smirnov test was performed to evaluate the normal distribution of the variables. Tests performed for independent groups were Student's *t*-test or the Mann-Whitney test, depending on their normality. Pearson's chi-squared and Fisher's exact tests were used for categorical

variables, depending on the expected count of events in a 2 × 2 contingency table. The degree of statistical significance was considered to be $p < 0.05$. All data were statistically analysed using the Statistical Package for the Social Sciences (SPSS) version 23 software (SPSS Inc., Chicago, IL, USA).

RESULTS

A total of 93,250 patients who suffered any trauma were reviewed during the research. Among them, 20,516 (22%) were aged 0–19 years. However, only 537 children and adolescents with oral and/or maxillofacial fractures were admitted, 330 due to traffic accidents. Male patients (257; 77.88%) were more affected than females (73; 22.11%), with a male/female ratio of 3.5:1 (Table 1). Motorcycle accidents were the most commonly reported aetiology (264; 80%), followed by runover (31; 9.39%) and cycling accidents (12; 3.64%).

Averages of 154.83 cases per year and 2.81 fractures per patient were presented. The middle third of the face was the most affected (578; 62.22%), followed by the lower (280; 30.14%) and upper thirds (71; 7.64%). When the mandible was observed, angle (61; 6.57%) and condyle (61; 6.57%) were mostly affected, followed by body (56; 6.03%) and parasymphysis (56; 6.03%).

To assess general trauma severity, the TRISS SpO_2 was performed (Table 2). It is observed that when the trauma involves a bicycle accident (0.059) or riding accident (0.058), the mean score is relatively low, with higher values for car accidents (0.242), runover (0.218), motorcycle accidents (0.136) and maritime accidents (0.135). The FISS, on the other hand, had the highest average values for car accidents (7.00), maritime accidents (6.70), motorcycle accidents (5.25) and runover (4.39), with the lowest values for accidents involving cycling (3.00) and animal transport (2.75), which can be seen in more detail in Table 2.

The relationship between the means of the FISS and TRISS SpO_2 data showed that the increase in the FISS scores is commonly associated with stability in the means of the TRISS SpO_2 scores, with values between 0.050 and 0.300. However, when an average score of 16 is obtained on the FISS there is a significant increase in the TRISS SpO_2 score, with a maximum average peak of 0.629, which returns to an average value of 0.131 when an average score of 18 is obtained on the FISS (Figure 1a). For facial fractures, the lowest mean scores were 0.035 for the TRIS SpO_2 in children aged 2 years and 1.66 for the FISS in adolescents aged 10 years. There were no cases in children aged 5 years or those under 2 years, thus achieving a mean of zero among these age groups. The highest averages were for children aged 0–4 years, with TRISS SpO_2 and FISS scores of 0.385 and 7.5, respectively.

When related, there is a large increase in the mean value for the 0-4 and 5-9 age groups and then a slow increase between the two groups of adolescents. It should be added that, after the peak of growth of the FISS values of the groups of children aged 0-4 and 5-9 years, there was a decrease in these same values. (Figure 1b).

The relationship between the average values of the TRISS SpO_2 in relation to age was similar with regard to the characteristics presented in the relationship between the FISS and age, the only difference being in the values for 10-year-old adolescents, as growth occurred only after age 13 years and not at 10 years (Figure 1c).

The OMHD and GHD of the age group with the highest average (0–4 years) was 20.66 days, but a female car accident hospitalization of 69 days increased the general average in this age group. Regarding the variables within the TA, it was found that they stayed between 10.08 OMHD and 15.77 GHD. With regard to the OMHD, the variables were between 8.5 and 13 days (Table 3).

The OMHD means of facial trauma showed a proportional relationship with the FISS: the higher the value of the FISS, the greater the average days of hospitalization, from a FISS score of 1 (9.15 OMHD) to a final score of 18 (22.16 OMHD).

The TRISS SpO_2 in relation to the gross averages of GHD also showed a proportional relationship: the higher the value of the cited scale, the greater the average days of hospitalization, from an average TRISS SpO_2 score of 0.10 (10.32 GHD) to a final score of 0.99 (29.50 GHD).

With regard to other relevant data, 116 patients received non-operative treatment, 182 underwent surgical treatment and 98 patients received both treatments. In the cases of head trauma, 102 patients presented the mildest to the most severe form. In addition, there were eight deaths, three patients abandoned treatment and 100 were transferred to other services.

Statistical analysis results

The present results showed a significant relationship between male patients and motorcycle accidents ($p < 0.0001$), male patients aged 0–4 years and runover ($p = 0.0003$), male patients aged 5–9 years and runover ($p = 0.0002$), male patients aged 10–14 years and motorcycle accidents ($p < 0.0001$) and male patients aged 15–19 years and motorcycle accidents ($p < 0.0001$). Regarding fractures, mandible fracture was significantly associated with male patients ($p = 0.0024$), and male patients aged 15–19 years were associated with mandible fracture ($p = 0.0016$). In contrast, no significant results were found in patients aged 5–9, 10–14 and 15–19 years in relation to fractures.

With regard to the TRISS SpO_2 and FISS, a significant association was observed between female patients with high TRISS SpO_2 and car accidents ($p < 0.0001$). Female patients aged 0–4 years were significantly correlated with high TRISS SpO_2 levels in runover ($p =$

0.0002), male patients aged 5–9 years were significantly correlated with high TRISS SpO_2 levels in car accidents ($p < 0.0001$), female patients aged 10–14 years were statistically related to high TRISS SpO_2 levels in motorcycle accidents ($p < 0.0001$) and male patients aged 15–19 years were associated with high TRISS SpO_2 levels in maritime accidents ($p < 0.0001$). With regard to the FISS variables, female patients were statistically correlated with car accidents ($p < 0.0001$), female patients aged 0–4 years were associated with high FISS levels and car accidents ($p < 0.0001$), male patients aged 5–9 years were correlated with high FISS levels in maritime accidents ($p = 0.0007$), male patients aged 10–14 years were related to high FISS levels in maritime accidents ($p < 0.0001$) and female patients aged 15–19 years were statistically related to cycling accidents ($p < 0.0001$).

Regarding GHD, a significant result with a high GHD was found when females were correlated with car accidents ($p < 0.0001$), when male patients aged 0–4 years were associated with car accidents ($p = 0.0009$) and when male patients aged 5–9 years were correlated with runover ($p < 0.0001$). In contrast, patients aged 10–14 and 15–19 years were not correlated with any aetiology or GHD. When evaluating OMHD, a higher OMHD was observed when female patients were associated with car accidents ($p < 0.0001$), female patients aged 0–4 years were related to car accidents ($p = 0.0097$) and male patients aged 5–9 years were associated with maritime accidents ($p = 0.0136$). In contrast, no association was observed between patients aged 10–14 and 15–19 years and any aetiology or OMHD.

DISCUSSION

Traffic accidents in children are accepted as one of the leading causes of maxillofacial fractures and major causes of mortality and disability worldwide (Yazici e Aytaç, 2019). Scoring systems to determine severity in paediatric trauma depend on age and mechanism of injury, as

there are significant differences in the physiology of infants, children and adolescents, and their responses to injuries are not the same as in adults(Keskey *et al.*, 2021).

In this study, we showed that the number of facial fractures substantially increased with age. We support the view that adolescents' lifestyle is closer to the adult lifestyle, whereas children are less involved in dangerous activities because they are usually under supervision(Bilgen, Ural e Bekerecioğlu, 2019; Boffano *et al.*, 2015). In addition, paediatric craniofacial bone has unique characteristics to protect the facial bones from trauma, being more stable due to the greater elasticity of the bone, nature of the adipose tissue and lack of pneumatization of the sinuses, with the unerupted permanent dentition giving additional strength to the jaw bones(Yazici e Aytaç, 2019). Even with a higher number of fractures in the 15–19-year age group of this study, there was no proportionally higher statistical significance for the severity of body trauma with the TRISS SpO_2 and facial fracture with the FISS in relation to the other age groups. Among the aetiologies, there is a prevalence of traumas in motorcycle accidents but, as with the age groups, there was no absolute prevalence of statistical significance in relation to the other aetiologies.

Our data are also in accord with the very recent evidence supporting males as presenting more fractures than females(Barbosa *et al.*, 2017; Boffano *et al.*, 2015; Bregagnolo *et al.*, 2013; Rêgo *et al.*, 2020). This may be related to several factors: men participate in activities that are more physical and often are more aggressive than women, involving themselves in a greater number of aetiologies, whereas women are more associated with aetiologies that have less trauma exposure(Boffano *et al.*, 2015; Zhou *et al.*, 2019). Previous literature reported that the mean severity of general and maxillofacial trauma is higher in male patients; however, this factor was not observed in our study, which presented similar means in males and females on the FISS and TRISS SpO_2 scales(Alonge *et al.*, 2021; Lin *et al.*, 2020b).

Studies indicate that injuries in different parts of the body act to increase or decrease the occurrence of problems of growth in young people (Mitchell *et al.*, 2021). Thus, the present study correlated the FISS and TRISS SpO_2 scales, verifying that there is statistical significance and a numerical relationship of trauma severity in the face with injuries in other regions of the body.

In this study, mandibular fractures were the most frequently encountered facial fractures in all age groups, which agrees with previously published studies(Bilgen, Ural e Bekerecioğlu, 2019; Boffano *et al.*, 2015; Boyette, 2014; Hanna, Ismael e Al-Assaf, 2016). Condyle and mandibular angle fractures are the most prevalent in the bones of the lower third of the face, mainly and proportionally in the group aged 0–4 years(Bilgen, Ural e Bekerecioğlu, 2019; Chandra e Zemplenyi, 2017; Hanna, Ismael e Al-Assaf, 2016). However, orbital fractures involving the walls and floor are more common in patients older than 7 years of age(Pullos e Krishnan, 2019).

The aetiology of facial fractures varies depending on social, cultural and environmental factors(Imahara *et al.*, 2008). Traffic accidents, which are high-energy impacts, are reported as aetiologies with high severity in general and maxillofacial trauma and can be graded within the TRISS SpO_2 and FISS scales(Alonge *et al.*, 2021; Imahara *et al.*, 2008; Mitchell *et al.*, 2021). In this study, among the traffic accidents there is a prevalence of motorcycle accidents. The high percentage of male victims aged 15–19 years is noteworthy. There is currently a consensus in the literature that the vast majority of maxillofacial trauma is associated with this aetiology(Barbosa *et al.*, 2017; Bregagnolo *et al.*, 2013; Rêgo *et al.*, 2020). Children using motorcycles, either as drivers or pillion riders, is a reality in many Brazilian cities and infants are often carried on motorcycles by the driver or another passenger. This makes children and adolescents vulnerable to accidents. Furthermore, many of these individuals do not use crash helmets.

A lack of public transport in the metropolitan area of the city forces the population, especially young people, to use motorcycles and bicycles as a means of public transport, often with little or no safety equipment(Cavalcanti *et al.*, 2014; Hirobe *et al.*, 2021b; Kelton *et al.*, 2021). Accidents involving pedestrians are also very common and have a high rate of morbidity due to the relatively small mass of the pedestrian compared to a car, thus offering little resistance and absorbing the energy of the impact(Cavalcanti *et al.*, 2014) The data on aetiology were significantly related to runover, car accidents and motorcycle accidents in the TRISS SpO_2 and to motorcycle and cycling accidents in the FISS, showing a variety of significance within the severity of the trauma according to the means of transport (two- or four-wheel vehicles).

In countries of Asia, 14.28% of maxillofacial traumas are associated with falls due to animal riding. In these countries, horse breeding is prevalent and is the oldest traditional branch of livestock in Asia(Yuldashev *et al.*, 2020). Regarding maritime traffic, in some places this form of transport is commonly used due to the large network of waterways found or used in sport activities, as in the region of this study. Although accidents are not so common, the absence of safety equipment can lead to an emergency in most cases(Garri *et al.*, 1999). In our research, we found statistically significant data on maritime accidents for the TRISS SpO_2 in men aged 15–19 years and for the FISS in men aged 5–9 and 10–14 years, showing the great severity of this aetiology.

In agreement with previous studies(Khan *et al.*, 2019), found that in traffic accidents the middle third of the face is more affected by facial fractures in children and adolescents, with the zygomatic complex mostly affected(Reich, Aust e Eckert, 2019; Yazici e Aytaç, 2019)In other studies, even the results indicating the same prevalence in relation to age showed a greater number of fractures in the lower third of the face, in contrast to the results of this study. Another point is that the authors report the lower third as more accessible during trauma, but in many cases the victim assumes a defensive position, lowering the chin before facial trauma and

making the middle of the face more susceptible to injuries or fractures(Bilgen, Ural e Bekerecioğlu, 2019; Guo *et al.*, 2021; Roccia *et al.*, 2019; Yamamoto *et al.*, 2019). As in this study, other research indicated that more than one-third of the face can be involved in facial trauma, with one or more bone fractures(Rodrigues *et al.*, 2020).

Considering our study, the severity of maxillofacial trauma according to the FISS in paediatric patients has higher statistical significance than injuries in the rest of the body if we consider the TRISS SpO_2(Imahara *et al.*, 2008). Regarding severity, greater severity was observed in multiple facial trauma patients. This corroborates with other findings in the literature, where facial fractures are directly related to traumatic brain injury even when there is absorption of the trauma by the mandible(Rêgo *et al.*, 2020; Rodrigues *et al.*, 2020). In this study, mandible fractures had the most statistically significant data, with emphasis on males aged 15–19 years.

Our study corroborates the literature, where patients with the highest averages of the TRISS SpO_2 and FISS scores were those who also had the highest averages of GHD and OMHD; this can be understood by the fact that the more severe the trauma, the greater the chance of the patient needing longer hospitalization for general and facial treatment(Hirobe *et al.*, 2021b).

Pediatric facial fracture requires a high-energy impact trauma, influencing other parts of the body and it is necessary to perform this complete evaluation. Concomitant injuries have been reported in up to 55% of paediatric patients with facial trauma. Similarly, we found a high number of concomitant injuries in this study. Furthermore, concomitant lesions tend to increase in higher age groups, similar to previous studies(Ferreira *et al.*, 2016). Traumatic brain injury represents the most prevalent cause of incapacity and death in children (Rêgo *et al.*, 2020)In this study, traumatic brain injury associated with a traffic accident suggests the severity of the

trauma. This can be explained by the low adherence of adolescents to traffic laws, such as the mandatory use of helmets and seat belts, and, because the skull in a child is bigger than the bones of the face. The literature shows that traumatic brain injury leads to a worse prognosis, such as developmental delay, cerebral palsy, epilepsy and death.(Hung, 2020; Kelton *et al.*, 2021).

CONCLUSION

We conclude that the correlation of the FISS and TRISS SpO_2 with the age of children and adolescents and the aetiology of traffic accidents with facial trauma was significant in several aspects, showing more efficiency, amplitude and precision in determining the severity and mortality of these patients.

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TABLES

Table 1. Types of traffic accidents and fracture variables.

Etiology and fracture	**Gender**			**Age (years)**											**Total**
Variables	**Male**	**Female**	**P-value**	**0 - 4**		**P-value**	**05--09**		**P-value**	**10--14**		**P-value**	**15 - 19**		**P-value**	
				Male	**Female**		**Male**	**Female**		**Male**	**Female**		**Male**	**Female**		
Number of cases	257 (77.88)	73 (22.12)		9 (2.73)	3 (0.91)		11 (3.33)	3 (0.91)		23 (6.97)	11 (3.33)		214 (64.85)	56 (16.97)		330 (100.00)
Motocicle	211 (63.94)	53 (16.06)	0.1377	1 (0.3)	1 (0.30)	1.0	2 (0.61)	1 (0.30)	1.0	12 (3.64)	3 (0.91)	1.0	196 (59.39)	48 (14.54)	0.1102	264 (80.00)
Run over	20 (6.06)	11 (3.33)		4 (1.21)	1 (0.30)		5 (1.51)	2 (0.61)		5 (1.51)	4 (1.21)		6 (1.82)	4 (1.21)		31 (9.39)
Maritime	6 (1.82)	4 (1.21)		1 (0.30)	-		2 (0.61)	-		1 (0.30)	1 (0.30)		2 (0.61)	3 (0.91)		10 (3.03)
Car	8 (2.42)	1 (0.30)		1 (0.30)	1 (0.30)		1 (0.30)	-		1 (0.30)	-		5 (1.51)	-		9 (2.73)
Cycling	8 (2.42)	4 (1.21)		-	-		1 (0.30)	-		3 (0.91)	3 (0.91)		4 (1.21)	1 (0.30)		12 (3.64)
Transport animal	4 (1.21)	-		2 (0.61)	-		-	-		-	-		2 (0.61)	-		4 (1.21)
Fracture variables																
Number of fractures	740 (79.65%)	189 (20.34%)		19 (2.04%)	13 (1.40%)		30 (3.23%)	5 (1.52%)		47 (5.06%)	26 (2.80%)		644 (69.32%)	145 (15.61%)		929 (100%)
Zygomatic	159 (17.12%)	39 (4,20%)	0.9240	3 (0,32%)	1 (0,11%)	1.0	7 (0.75%)	-	0.4688	16 (1.72%)	6 (0.65%)	0.3383	133 (14.32%)	32 (3.44%)	0.6761	198 (21.31%)
Mandible	218 (23.47%)	58 (6,24%)		10 (1,08%)	6 (0,65%)		10 (1.08%)	3(0.32%)		11 (1.18%)	13 (3,94%)		187 (20,13%)	36 (3.88%)		276 (29.71%)
Maxilla	117 (12.59%)	25 (2,69%)		-	2 (0,22%)		2(0.22%)	1 (0.11%)		4 (0.43%)	1 (0,11%)		111 (11,95%)	21 (2.26%)		142 (15.29%)
Nasal	49 (5.27%)	14 (1.51%)		1 (0.11%)	1 (0.11%)		1 (0.11%)	1 (0.11%)		4 (0.43%)	3 (0.32%)		43 (4.63%)	9 (0.97%)		63 (6.78%)
Orbit	75 (8.07%)	17 (1.83%)		2 (0.22%)	1 (011%)		4 (0.43%)	-		4 (0.43%)	2 (0.22%)		65 (7.00%)	14 (1.51%)		92 (9.90%)
Naso-orbital-ethmoidal	48 (5.17%)	12 (1.29%)		2 (0.22%)	1 (0.11%)		3 (0.32%)	-		1 (0.11%)	-		42 (4.52%)	11 (1.18%)		60 (6.46%)
Frontal	59 (6.35%)	17 (1.83%)		1 (0.11%)	1 (0.11%)		2 (0.22%)	-		5 (1.52%)	-		51 (5.49%)	16 (1.72%)		76 (8.18%)
Dentoalveolar	15 (1.61%)	7 (0.75%)		-	-		1 (0.11%)	-		2 (0.22%)	1 (0.11%)		12 (1.29%)	6 (0.65%)		22 (2.37%)

Table 2. Study average TRISS SpO2 and FISS in etiology of traffic accidents.

TRISS SpO2 and FISS	**Gender**			**Age (years)**											**Total**
	Male	**Female**	**P-value**	**0 - 4**			**05-09**			**10-14**			**15 - 19**			
				Male	**Female**	**P-value**	**Male**	**Female**	**P-value**	**Male**	**Female**	**P-value**	**Male**	**Female**	**P-value**	
TRISS SpO2 average																
Score average	0.148	0.160		0.086	0.592		0.178	0.177		0.121	0.200		0.152	0.127		0.151
Motocicle	0.149	0.132	0.2949	0.031	0.032	0.3716	0.039	0.060	0.2960	0.075	0.335	0.7749	0.155	0.123	0.4116	0.136
Run over	0.172	0.300		0.137	0.946		0.179	0.236		0.308	0.265		0.077	0.208		0.218
Maritime	0.179	0.069		0.047	-		0.091	-		0.060	0.032		0.393	0.082		0.135
Car	0.173	0.799		0.424	0.799		0.825	-		0.051	-		0.091	-		0.242
Cycling	0.056	0.065		-	-		0.047	-		0.042	0.037		0.068	0.150		0.059
Transport animal	0.058	-		0.047	-		-	-		-	-		0.068	-		0.058
FISS variables																
Score average	5.20	4.96		3.88	8.66		5.18	2.33		3.69	3.54		5.41	5.18		5.14
Motocicle	5.32	4.94	0.5632	2.00	5.00	0.6226	2.50	3.00	0.1795	4.75	5.66	0.4989	5.40	4.94	0.7387	5.25
Run over	4.85	3.54		5.00	4.00		4.8	2.00		2.8	2.75		6.5	5.00		4.39
Maritime	6.33	7.25		4.00	-		11.00	-		6.00	5.00		3.00	8.00		6.70
Car	5.75	17.00		4.00	17.00		2.00	-		2.00	-		7.60	-		7.00
Cycling	2.62	3.75		-	-		4.00	-		1.00	2.00		3.50	9.00		3.00
Transport animal	2.75	-		2.50	-		-	-		-	-		3.00	-		2.75

Table 3. Variables of days of hospitalization in general and maxillofacial clinical in etiology of traffic accidents.

General and maxillofacial days hospitalization	Gender			Age (years)											Total
				0 - 4			05--09			10--14			15 - 19		
	Male	Female	P-value	Male	Female	P-value	Male	Female	P-value	Male	Female	P-value	Male	Female	P-value	
General days hospitalization																
Score average	13.70	13.90		12.55	29.33		16.10	9.66		15.57	10.50		13.45	13.90		13.75
Motocicle	13.71	14.56	0.3966	15.00	14.00	0.2818	9.00	11.00	0.6574	16.08	21.66	0.5809	13.60	14.18	0.3995	13.88
Run over	17.11	9.09		14.50	5.00		23.50	9.00		21.50	6.25		11.66	13.00		14.07
Maritime	13.50	11.33		13.00	-		17.50	-		11.00	6.00		11.00	11.33		12.77
Car	9.12	69.00		7.00	69.00		11.00	-		3.00	-		10.40	-		15.77
Cycling	11.62	7.00		-	-		3.00	-		11.33	5.00		14.00	13.00		10.08
Transport animal	11.00	-		10.00	-		-	-		-	-		12.00	-		11.00
Maxillofacial days hospitalization																
Score average	11.21	11.19		11.11	28.00		11.36	8.00		11.26	7.91		11.19	11.11		11.20
Motocicle	11.42	11.28	0.3515	15.00	13.00	0.3099	8.50	10.00	0.9123	12.58	14.66	0.7968	11.36	11.06	0.2194	11.39
Run over	11.75	7.73		12.25	2.00		14.00	7.00		11.40	6.25		9.83	11.00		10.32
Maritime	11.83	10.00		13.00	-		15.50	-		5.00	6.00		11.00	11.33		11.10
Car	6.00	69.00		7.00	69.00		4.00	-		3.00	-		6.80	-		13.00
Cycling	9.62	6.25		-	-		3.00	-		10.66	4.00		10.50	13.00		8.50
Transport animal	10.00	-		8.00	-		-	-		-	-		12.00	-		10.00

FIGURE

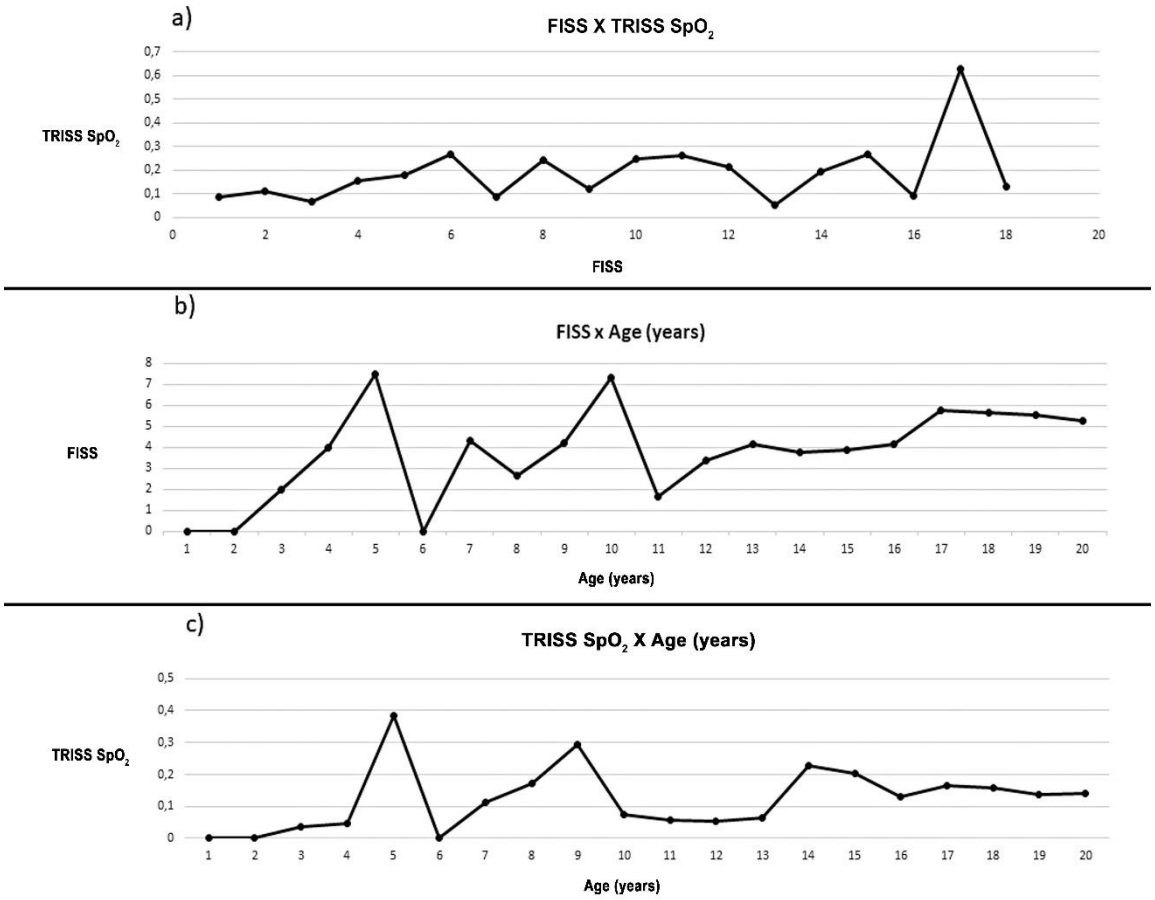

Figure 1. a) Comparison between the value FISS and TRISS SpO_2 severity scales. b) Comparison between the value of the FISS severity scales and ages. c) Comparison between the value of the TRISS SpO_2 severity scales and ages.

STROBE

Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	1
Objectives	3	State specific objectives, including any prespecified hypotheses	2
Methods			
Study design	4	Present key elements of study design early in the paper	2
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	3
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	3
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*4*
Bias	9	Describe any efforts to address potential sources of bias	
Study size	10	Explain how the study size was arrived at	3
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	4-5

Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	4-5
		(*b*) Describe any methods used to examine subgroups and interactions	
		(*c*) Explain how missing data were addressed	
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	

Results

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	5
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	2
		(b) Indicate number of participants with missing data for each variable of interest	
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	*5-6*
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted	

		estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	
		(*b*) Report category boundaries when continuous variables were categorized	
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	9
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	9,10,11
Generalisability	21	Discuss the generalisability (external validity) of the study results	12
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

CONCLUSÃO

Concluímos que a correlação do FISS e TRISS SpO2 com a idade de crianças e adolescentes e a etiologia dos acidentes de trânsito com trauma facial foi significativa em vários aspectos, mostrando maior eficiência, amplitude e precisão na determinação da gravidade e mortalidade desses pacientes.

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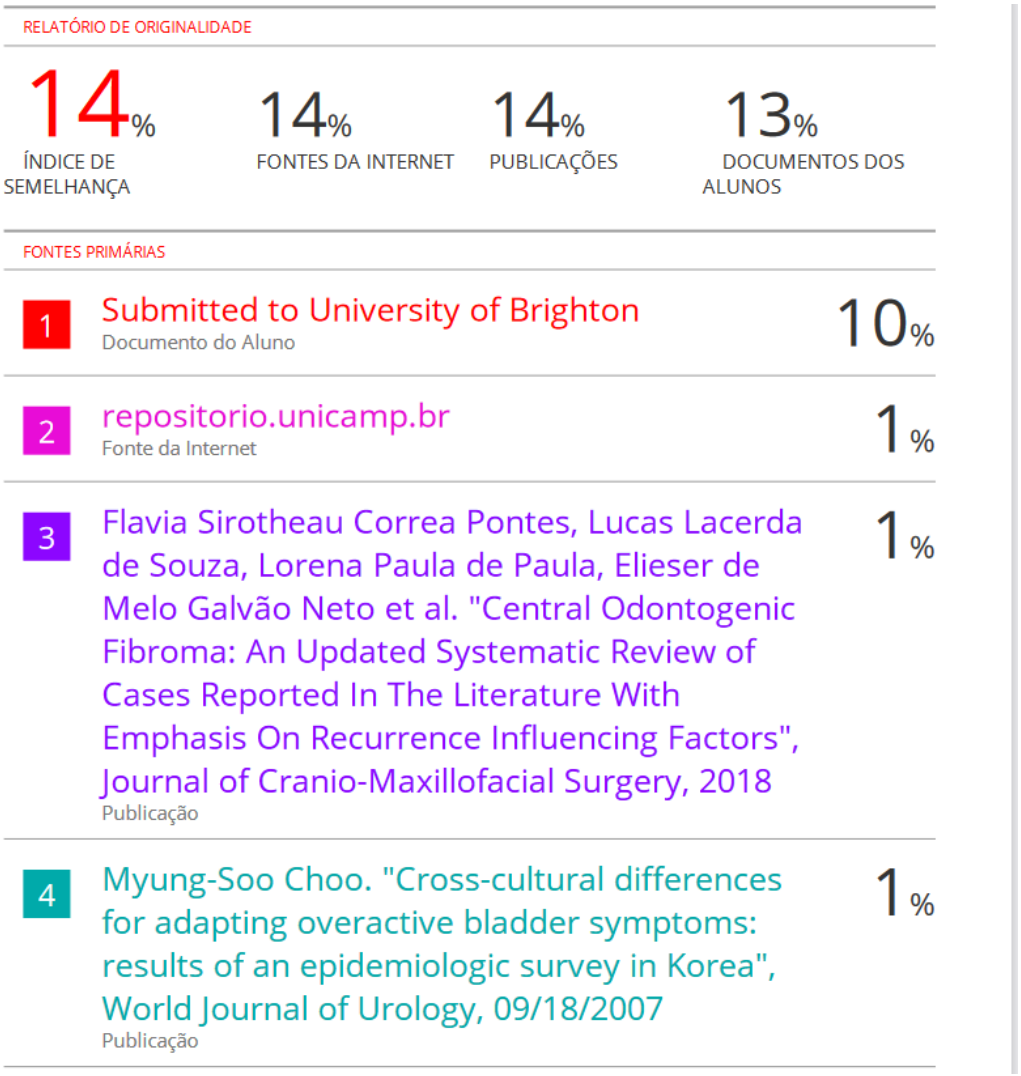
ANEXOS

Anexo 1 – Verificação de originalidade e prevenção de plágio



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4	Myung-Soo Choo. "Cross-cultural differences for adapting overactive bladder symptoms: results of an epidemiologic survey in Korea", World Journal of Urology, 09/18/2007 Publicação	1%

Anexo 2 - Certificado do comitê de ética em pesquisa

UFPA - INSTITUTO DE CIÊNCIAS DA SAÚDE DA UNIVERSIDADE FEDERAL DO PARÁ

PARECER CONSUBSTANCIADO DO CEP

DADOS DA EMENDA

Título da Pesquisa: ESTUDO RETROSPECTIVO DOS TRAUMAS FACIAIS ATENDIDOS NA RESIDÊNCIA EM CIRURGIA E TRAUMATOLOGIA BUCOMAXILOFACIAL DA UNIVERSIDADE FEDERAL DO PARÁ

Pesquisador: Nicolau Conte Neto

Área Temática:

Versão: 4

CAAE: 34572820.3.0000.0018

Instituição Proponente: Instituto de Ciências da Saúde da Universidade Federal do Pará - ICS/ UFPA

Patrocinador Principal: Financiamento Próprio

DADOS DO PARECER

Número do Parecer: 5.528.565

Apresentação do Projeto:

Este estudo terá como finalidade avaliar a o perfil dos pacientes de trauma facial atendidos pelo serviço de residência em Cirurgia e Traumatologia Bucomaxilofacial (CTBMF) da Universidade Federal do Pará (UFPA). Será realizado um estudo retrospectivo de traumas no serviço do Hospital Metropolitano de Urgência e Emergência (HMUE), por meio da análise de prontuários no período de 2013 a 2019 de pacientes atendidos. Serão selecionados prontuários de pacientes com diagnóstico confirmado de fraturas faciais, sendo avaliados os seguintes dados clínicos dos pacientes: sexo, idade, data de admissão hospitalar, etiologia, comorbidades, exame clínico, localização e quantidade de fraturas faciais, localização e quantidade de lesões concomitantes de tecido mole da face, sequelas faciais, lesões concomitantes em outras regiões do corpo, quantidade de dias de internação e acompanhamento pela cirurgia buco-maxilo-facial, tipo de tratamento empregado e desfecho do paciente. Os dados serão organizados na tabela do Excel. De acordo com os resultados, vamos observar individualmente as etiologias de trauma, o acometimento em crianças, idosos e mulheres, além de avaliar as regiões mais acometidas na face. Portanto, esse estudo pode facilitar o diagnóstico para profissionais da saúde que atendam traumas faciais, diminuindo assim a demora no tratamento.

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Objetivo da Pesquisa:

Objetivo Primário:

Realizar um estudo retrospectivo dos traumas faciais no Serviço de Residência em Cirurgia e Traumatologia Bucomaxilofacial da Universidade

Federal do Pará.

Objetivo Secundário:

Realizar um estudo retrospectivo dos traumas faciais em pacientes idosos, em crianças e adolescentes, em mulheres, em pacientes vítima de violência urbana, de acidentes de trânsito, etiologias relacionas a região amazônica como acidente de barco, queda de árvore e acidentes com animais, e pacientes com fraturas de mandíbula na Residência de CTBMF no serviço do Hospital Metropolitano de Urgência e Emergência (HMUE).

Avaliação dos Riscos e Benefícios:

Riscos:

Os riscos com a pesquisa em questão serão mínimos. Estes são em relação ao risco de quebra da confidencialidade e privacidade dos usuários. Entretanto, serão tomadas todas as medidas necessárias para proteção e minimização dos mesmos. Os pesquisadores envolvidos garantem que não utilizarão das informações coletadas nos prontuários para manter qualquer contato com os usuários e/ou familiares. Assegurar a confidencialidade e a privacidade, a proteção dos dados e a não estigmatização dos participantes da pesquisa, garantindo a não

utilização das informações em prejuízo das pessoas e/ou das comunidades, inclusive em termos de autoestima, de prestígio e/ou de aspectos econômico-financeiros. Dentre os procedimentos para a proteção destes dados, a utilização de computadores e HDs externos protegidos por usuário e senhas específicas utilizadas na Residência de Bucomaxilofacial do HUJBB.

Benefícios:

Os benefícios com a realização da pesquisa e análise dos resultados incluem a identificação do perfil do local do estudo em questão e possibilitarão o desenvolvimento de políticas públicas específicas para a população do estado. Podendo assim, facilitar o atendimento a esta demanda, visando facilitar diagnósticos para profissionais da saúde, acelerando o tratamento e fornecendo um levantamento que ainda não foi documentado na região Norte.

Comentários e Considerações sobre a Pesquisa:

o protocolo encaminhado, dispõe de metodologia e critérios definidos conforme resolução 466/12 do CNS/MS. Trata ainda em resolver pendências de uma emenda citadas no parecer nº5.513.566,

que depois de ser analisado por este colegiado, entende-se como pendências resolvidas e aceitas. A emenda tem como justificativa a solicitação de inclusão de pesquisadores (Thiago Brito Xavier e Dr. Helder Antônio Rebelo Pontes) de instituição UNICAMP-SP coparticipante (já inclusa) que participarão da coleta e análise de dados da
referente pesquisa.

Considerações sobre os Termos de apresentação obrigatória:

Os termos apresentados, nesta versão, contemplam os sugeridos pelo sistema CEP/CONEP.

Conclusões ou Pendências e Lista de Inadequações:

Diante do exposto somos pela aprovação do protocolo. Este é nosso parecer, SMJ.

Considerações Finais a critério do CEP:

Este parecer foi elaborado baseado nos documentos abaixo relacionados:

Tipo Documento	Arquivo	Postagem	Autor	Situação
Informações Básicas do Projeto	PB_INFORMAÇÕES_BÁSICAS_1953760_E2.pdf	14/07/2022 15:12:09		Aceito
Outros	Instrumento_deColeta_deDados.docx	14/07/2022 15:08:15	CLARINA LOUIS SILVA MEIRA	Aceito
Outros	TCUD.pdf	14/07/2022 15:07:21	CLARINA LOUIS SILVA MEIRA	Aceito
Declaração de Instituição e Infraestrutura	Termo_HMUE.pdf	14/07/2022 15:06:31	CLARINA LOUIS SILVA MEIRA	Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	Justificativa_AusenciaTCLE.pdf	14/07/2022 15:05:48	CLARINA LOUIS SILVA MEIRA	Aceito
Folha de Rosto	FOLHADEROSTOASSINADA.pdf	22/05/2020 11:14:45	CLARINA LOUIS SILVA MEIRA	Aceito
Outros	TERMODEACEITEDOORIENTADOR.docx	19/05/2020 18:09:03	CLARINA LOUIS SILVA MEIRA	Aceito
Outros	CARTADEENCAMINHAMENTO.docx	19/05/2020 18:08:27	CLARINA LOUIS SILVA MEIRA	Aceito
Outros	DECLACAOONUSFINANCEIRO.docx	19/05/2020 18:07:47	CLARINA LOUIS SILVA MEIRA	Aceito
Declaração de Pesquisadores	TERMODECOMPROMISSODOPESQUISADOR.docx	19/05/2020 18:03:32	CLARINA LOUIS SILVA MEIRA	Aceito
Projeto Detalhado / Brochura Investigador	PROJETOTRAUMA.docx	19/05/2020 18:02:42	CLARINA LOUIS SILVA MEIRA	Aceito

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Continuação do Parecer: 5.526.565

Situação do Parecer:
Aprovado

Necessita Apreciação da CONEP:
Não

BELEM, 14 de Julho de 2022

Assinado por:
Wallace Raimundo Araujo dos Santos
(Coordenador(a))

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Anexo 3 – Documento de submissão do artigo

Injury

IS THERE ANY CORRELATION BETWEEN FISS AND TRISS SpO2 SEVERITY SCALE IN CHILDREN AND ADOLESCENTS' VICTIMS OF TRAFFIC ACCIDENTS?

--Manuscript Draft--

Manuscript Number:	JINJ-D-22-00792
Article Type:	Full length article
Keywords:	injury severity score; paediatric emergency medicine; facial injuries; emergency service hospital
Corresponding Author:	Thiago Brito Xavier, MD State University of Campinas Piracicaba, São Paulo BRAZIL
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	Diogo de Vasconcelos Macedo, MSc
	Marcelo Silva Monnazzi, PhD
	Nicolau Conte Neto, PhD
	Hélder Antônio Rebelo Pontes, PhD
Abstract:	Introduction: Severity scales quantify the probability of survival from the severity of the trauma. Correlation between the Facial Injury Severity Scale (FISS) and the Trauma Injury Severity Scale peripheral oxygen saturation (TRISS SpO 2) in child and adolescent victims of traffic accidents corroborates with better accuracy the verification of severity, trauma mortality and the standardized epidemiological profile, which are of great importance in emergency care. Materials and methods: This cross-sectional, retrospective observational study included 330 child and adolescent (age 0–19 years) victims of traffic accidents with facial fractures. Means and percentages were presented as descriptive statistics, using the Kolmogorov-Smirnov test to assess the normality of the variables. For analysis of independent groups, Student's t -test or the Mann-Whitney test was used. Furthermore, Pearson's chi-square and Fisher's exact tests were used for categorical variables. Results: The relationship between the FISS and TRISS SpO 2 showed stability of the TRISS SpO 2 with a mean value of 0.175 when the FISS score is below 16 but an increase to 0.380 when the FISS score is between 16 and 18. Regarding the level of significance, an association was observed with high TRISS SpO 2 for females aged 0–4 years in pedestrian accidents (p =0.0002), males aged 5–9 years in car accidents (p <0.0001), females aged 10–14 years in motorcycle accidents (p <0.0001) and males aged 15–19 years in maritime accidents (p <0.0001). With the FISS, we have significance for females aged 0–4 years in car accidents (p < 0.0001), males aged 5–9 years in maritime accidents (p =0.0007), males aged 10–14 years in maritime accidents (p <0.0001) and males aged 15–19 years in cycling accidents (p <0.0001). Conclusion: Correlation of the FISS and TRISS SpO 2 in child and adolescent victims of facial trauma in traffic accidents proved to be efficient and the most accurate determination of trauma severity.
Suggested Reviewers:	