

Interdisciplinary Doctoral School

PhD field: MEDICINE

DOCTORAL THESIS – ABSTRACT

**TRAUMA MANAGEMENT IN ORO-MAXILLO-FACIAL SURGERY AND ITS
IMPACT ON QUALITY OF LIFE**

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Keywords: *trauma; maxillofacial; statistical analysis; management; trauma costs; classifications; etiology; correlations; impact; life quality; treatment methods*

INTRODUCTION

Oral and maxillofacial trauma is a key, highly sensitive topic in hospital units and for public health institutions worldwide.

This can be explained by the complexity and severity of these pathologies, which very often have a major impact on patients' quality of life and are often associated with high mortality, impaired masticatory, aesthetic, phonic, visual function and high social and economic costs.

In the oro maxillo facial sphere, even a minor trauma resulting in a trivial scar can cause a major impact on the quality of life due to the impairment of aesthetics, the patient's self-esteem and can also cause a delay and difficulty in the reintegration in the social and professional life of the individual.

It is important to note that the frequency of these pathologies is constantly increasing due to today's increasingly hectic pace of life. Oral and maxillofacial surgery is a more complex speciality, which requires a double licence in both general medicine and dental medicine and the completion of a 5-year residency, which is why a specialist in these types of pathologies is trained in a considerable time, approximately 14 years.

MOTIVATION FOR THE SELECTION OF THE THEME

Traumatology is the most common pathology in oral and maxillofacial surgery services, its etiology being varied, depending on geographical location, socio-economic status, level of education, level of culture, vicious habits such as alcohol or drug use. Depending on geographical location, the etiology of oro-maxillofacial trauma can be varied, ranging from motor vehicle accidents, to interpersonal violence, accidental falls, trauma through the use of firearms.

The need for specialist treatment must be a desideratum for patients because if left untreated, this pathology can cause sequelae, both aesthetic and functional, which can trigger a series of other disorders, organic or psychiatric.

We chose this study on the management of trauma in oral and maxillofacial surgery and its impact on quality of life because there are very few studies in the literature that examine this issue.

In order to draw some relevant conclusions about the management of trauma in the oral and maxillofacial sphere, studies based on previous data are needed regarding the type of pathology as well as etiology, demographics, etc.

In this paper we used as a retrospective study method the analysis of documents and database from the archive of the Sibiu County Emergency Hospital. We also used bibliographical data, such as specialized articles rated BDI, ISI and books from international literature.

RESEARCH OBJECTIVES:

The aim of this research on oro-maxillofacial trauma and its impact on quality of life is to study these pathologies in terms of etiology, gender distribution, background, degree of education of patients involved, aspects that can lead to an improvement and better understanding of these complex pathologies and to the development of management and treatment protocols that could increase the quality of medical care in this area.

Study I: Clinical and epidemiological study on patients with cranio maxillo facial trauma in Sibiu Emergency County Hospital between 2014-2017.

Study II: Economic analysis of maxillofacial trauma in SCJU Sibiu between 2014-2017.

Study III: Impact on the quality of life of patients with cranio maxillo facial trauma.

ETHICAL ISSUES

The entire study was carried out with data from the archives of the Sibiu County Emergency Hospital, data provided by the hospital statistics service, processed in the Excell system and then processed in the SPSS system, with the consent of the medical unit.

CURRENT STATE OF KNOWLEDGE

1.1 The Health-Disease relationship

More than 50 years ago, the World Health Organisation defined health as "complete physical, mental and social well-being and not merely the absence of disease or disability". This approach has the merit of capturing the positive nature of the concept of health.

Whatever the level of definition of health, it is important to differentiate the issue of the determinants of health. The tendency to restrict the definition of health to the negative, disease-free dimensions, coupled with the successes of the scientific investigative approach in medicine since the mid-19th century, have given health services a leading role in the practical application of methods based on new findings[1].

1.2 Performance of health care systems

The evaluation of the performance of health care systems is based on 7 fundamental types of values:

- Technical efficiency: This refers to the fact that whatever we produce, we must do it with minimum cost, involving the use of resources (doctors, nurses, drugs, equipment) in an efficient combination.
- Cost-effectiveness: We should combine these efficiently produced services in a way that maximises a certain index of population health status.
- Allocative efficiency: This is in fact an alternative to cost-effectiveness from economics. It postulates that we should use those resources, to produce those goods, which will satisfy to the greatest extent, the desires of the individual, based on his preferences.

- Equity in the health sector: It argues that outcomes (health status) or outputs (health care use) or opportunities should be fairly distributed.
- Cost-economic sustainability: We need to consider the possibility that even a cost-effective and efficient system may be too costly and not economically sustainable.
- Economic equity: Refers to the distribution of the burden of financing the health sector. As long as funding is borne by taxes paid by citizens, this assumption includes protecting people from the risk of bitter losses by sharing the risk of serious illness.
- Quality: It consists of two distinct issues. How well does the system work in terms of decision-making and skills related to the provision of care? The second issue includes accessibility to services, convenience, and how patients are treated[1].

Oral and Maxillofacial Surgery

Oral and maxillofacial surgery is a complex specialty that requires dual licensure in both general medicine and dentistry as well as a 5-year residency training period.

In Romania, in large cities such as Bucharest, Cluj Napoca, Timi oara, Ia i, Craiova, oral and maxillofacial surgery is organised in local emergency hospitals as stand-alone departments. Otherwise, in most cities this speciality is organised as a department, most often in ENT, general surgery or neurosurgery wards.

Pathology addressed

- Treatment of mandible fractures
- Treatment of midface fractures

- Treatment of oro-maxillofacial wounds
- Treatment of disorders associated with dental eruption or impaction
- Surgical treatment of periapical lesions
- Complicated dental extractions
- Treatment of dento-alveolar trauma
- Treatment of oro-maxillo-facial infections
- Preprosthetic chiurgical treatment
- Treatment of odontogenic conditions of the maxillary sinus
- Treatment of oral and cervicofacial soft tissue cysts
- Treatment of benign tumours of oral and cervicofacial soft parts
- Treatment of cysts, benign tumors, and osteopathies of the maxillary bones
- Treatment of malignant oro-maxillo-facial tumours
- Reconstructive plasty in oral and maxillofacial surgery
- Treatment of salivary gland disorders
- Surgical treatment of severe dentomaxillary anomalies
- Treatment of cleft lip and palate
- Treatment of temporomandibular joint
- Treatment of trigeminal neuralgia

In the Sibiu County Emergency Clinical Hospital, oral and maxillofacial surgery operates as a compartment within the ENT department, with 6 inpatient beds and 2 day hospital beds, as well as an integrated outpatient department.

Our department deals with all the pathology in the field of this speciality, both in Sibiu county and in neighbouring counties such as Vâlcea, Alba .

The requests to this department are very high, with diverse pathology, especially emergency pathology which is represented by oro maxillo facial trauma and cervico-facial infectious pathology.

Traumatology in the O.M.F. sphere

Very frequently the bony structures of the viscerocranium are the site of fractures due to the prominent position of the cephalic extremity. The aetiology of these pathologies is diversified, depending on the global localization, basically describing motor vehicle accidents, inter-human aggression, accidental falls, firearm trauma.

According to a retrospective study by Ogundare et al [9], which analysed mandible fractures observed in the United States of America, at the urban level it was observed that 79% of 1267 mandible fractures were caused by interpersonal violence, compared to a study by Chrcanovic et al [10], which shows that in Brazil 44% of mandible fractures were caused by motor vehicle accidents.

Also a study in Sao Paolo, conducted over a 6-year period, analysing 355 cases of facial trauma[11] concluded that young adult males are most prone to these types of trauma, with a male-female ratio of 4:1.

Interpersonal violence was found to be the leading cause of these injuries, followed by motor vehicle accidents. The mandible was the most frequently fractured facial bone (44.2%), followed by the nasal proper bone (18.9%).

Most cases of facial trauma according to this study were associated with alcohol consumption.

The reason why I chose to analyze the present topic was because in our country, searching the literature and online libraries, I was able to find only very few articles on these aspects of the analysis of oral and maxillofacial trauma, pathologies that require very careful management..

Management of the patient with oro maxillo facial trauma

Before applying specialist treatment for traumatic oral and maxillofacial pathologies, a complete assessment of the patient's vital functions, known internationally as ABC (airway, breathing, circulation), is necessary.

This protocol was originally developed to ease the memory of healthcare professionals and is generally used for trauma patients with or without impaired consciousness.

The airway, breathing and circulation work in a cascade. With the airway blocked, breathing can no longer take place and oxygen cannot be transported via the blood to the organs, resulting in hypoxia and cardiac arrest. Ensuring airway patency, breathing and ensuring a patient's circulatory function is therefore a desideratum in oro maxillo facial trauma.

Mechanisms of oral and maxillofacial fractures

The fracture mechanism results from the effect of the impact of the effector (dynamic) and the receptor (static).

The mandible, the second most common site of fractures in the oro-maxillofacial region, has a special architecture adapted to its functions, with a triple curvature.

The basilar portion of the mandibular body has a V-shaped curvature, the alveolar process has a U-shaped curvature and the mandibular angle has an L-shaped curvature. The mandible has a long-bone-like structure with dense cortices and cancellous bone inside.

Because of these curvatures, the mandible has areas of high strength and areas of low strength. The most common sites of mandibular fractures are found around areas of low strength, at the level of the neck of the mandibular condyle, at the level of the gonion or parasymphysis.

The signs of probability and certainty of a mandibular fracture coincide with those of other bones of the body, a particular symptom being the occlusal disorders occurring in displaced fractures, which play a major role in the diagnosis of these types of fractures[12].

Fractures may involve a single component of the viscerocranium or may be found with fracture lines of other bones of the facial mass, lesions of the orofacial soft parts, other injuries with or without vital risk[13].

Also the first place in viscerocranial fractures is represented by fractures of the nasal proper bones, which is explained by their simple protruding position, often being directly subjected to causative traumatic agents and by the low resistance of these small bones[15-19].

Viscerocranial bone reconstruction is one of the most common tasks for the oral and maxillofacial surgeon[20] The requirements of viscerocranial bone reconstruction are challenging in many ways[21-25].

The key to success must contain strict conditions for occlusion of the dentition, oral rehabilitation, and correct positioning of the facial bones.

Minor malpositions lead to various problems that are noticeable to both the patient and the surgeon. Many of the malpositions make oral rehabilitation almost impossible, and the aesthetic impact can affect the patient in the long term.[27-30]

The maxillary bones, by virtue of their placement in prominent areas of the face, impose considerable aesthetic demands[31]. The purpose of reconstruction is to ensure the morphology and positioning of the bone in relation to other surrounding structures, to restore bone continuity and to provide facial contour and support for the soft tissues[33].

The human face and facial mimicry are key elements for the social integration of the person, without which the person would lose their identity and personality[32].

PERSONAL CONTRIBUTION

STUDY I: CLINICO-EPIDEMIOLOGICAL STUDY ON PATIENTS WITH CRANIOFACIAL TRAUMA IN SIBIU EMERGENCY COUNTY CLINICAL HOSPITAL DURING 2014-2017

INTRODUCTION

Trauma in the oro-maxillo-facial sphere is manifold and its extent varies. Maxillofacial trauma is one of the major challenges for public health and health services, occupying the first place in oro-maxillofacial surgery.

Due to their severity and complexity, these injuries are often associated with high morbidity, loss of function and high aesthetic, social and economic cost, with impact on quality of life [93].

The aetiology of oral and maxillofacial fractures, has undergone changes in recent decades and continues to change. Different communities and different regions present different aetiologies of occurrence of these types of pathologies.

Obtaining data from different regions and cultures can help us understand how these pathologies are produced and guide us towards the best therapeutic option.

MATERIAL AND METHOD

This study is a retrospective one and is based on the statistical analysis of the electronic database of the Sibiu County Emergency Hospital, provided by this hospital structure.

The information available from this database includes aspects related to age, gender, background, level of education, diagnoses, treatments performed, length of hospitalisation, complications present during hospitalisation.

This study was conducted over a period of 4 years, between 1.01.2014 and 31.12.2017, including non-personal data of patients who presented to the Sibiu Emergency County Hospital with trauma in the oro-maxillo-facial sphere.

During the period of this study, a total of 1240 patients presented with fractures in the cranio maxillo facial sphere.

Initially, we tried to divide these pathologies by the quarters of the study years, which can show us which period of the year these pathologies are more frequent.

RESULTS

Thus we averaged the caseload over the whole period of the study, referred to the quarters of the year, and the figures show the following:

First quarter: 285 cases (22.98%)

Second quarter: 300 cases (24.19%)

Third quarter: 361 cases (29.11%)

Fourth quarter: 294 cases (23.71%)

It can be observed a constant evolution of the number of patients presenting these types of pathologies throughout the years with a decrease however in the last quarter, probably justified due to the fact that in the colder period of the year people do less outdoor activities thus reducing the causes of these types of traumas (Chi-Square=11.55, p=0.009).

Breakdown of the caseload by background

According to our study, out of the total group of 1240 patients, 694 (56.05%) came from urban areas, a slightly increased number compared to 545 (43.95%) who came from rural areas. (binomial test, p=0.000).

The more active daily life in cities, the higher number of cars and the more developed infrastructure in urban areas may be an explanation for the production of these types of

pathologies in these environments. Also the present stress due to the work duties of people in urban areas compared to those in rural areas may be responsible for some causes in the production of these pathologies.

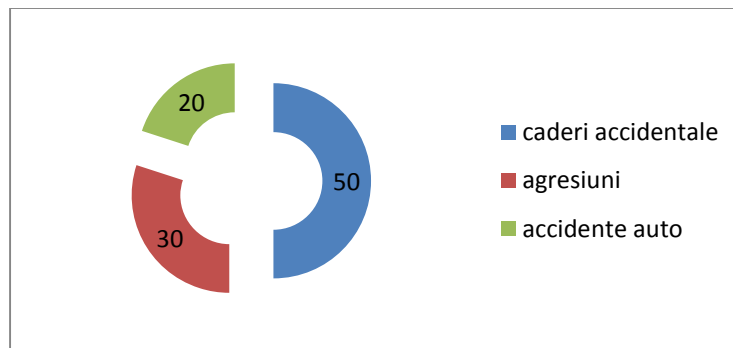
Although the percentage predisposition to cranio maxillo facial trauma in males in rural areas is lower, overall there is an increasing trend in the occurrence of cranio maxillo facial trauma in males in both urban and rural areas ($p=0.485$).

A breakdown of patients into 3 age groups, patients under 20 years, patients aged 20-40 years, patients over 40 years, was performed and a higher percentage of patients in the age group 20-40 years was found (58.15%; $p=0.000$). This is probably due to the fact that patients in this age group are involved in more activities in social life and are more prone to these pathologies.

From the point of view of etiology, a higher frequency of traumatic injuries due to accidental falls was found, possibly due to a hectic daily life, followed by aggression, interpersonal violence in our society being on the rise, with car accidents in third place, possibly due to the increasing number of vehicles and the modest infrastructure present ($p=0.001$).

The results of our study coincide with the results of a study in the Republic of Moldova, which shows in a retrospective study on 101 patients in 2018 and 147 patients in 2017, that the frequency of occurrence of trauma in the cranio maxillo facial sphere is found in the highest percentage in the age group 21-40 years, which constitutes 59.18% in 2017 and 53.46% in 2018 [96].

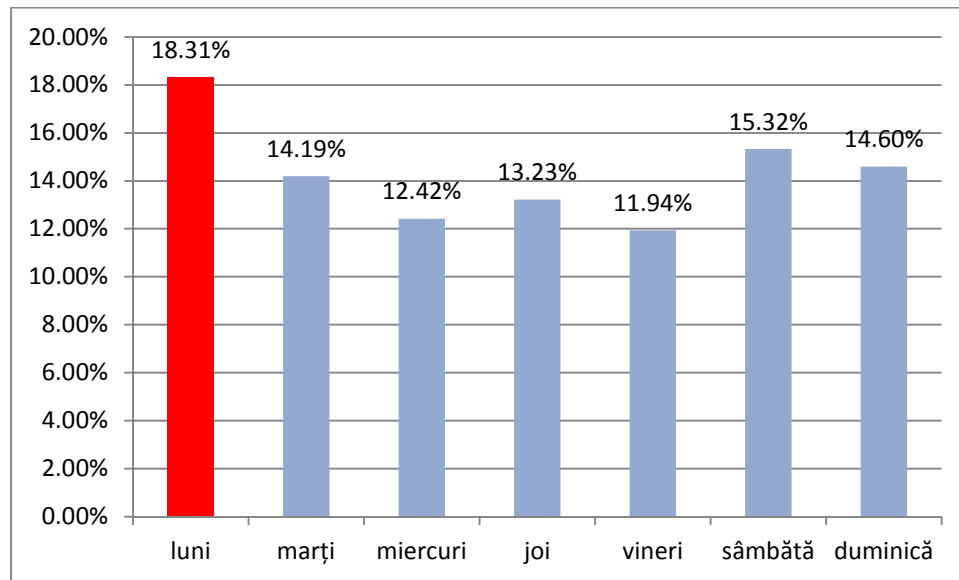
Figure 1: Etiology of cranio maxillo facial trauma.



In this study, the weighting by days of the week, in terms of the presentation of patients to SCJU Sibiu, was carried out, observing a high percentage on Mondays, probably due to the postponement of their presentation to the hospital in the case of injuries occurring over the weekend.

The lowest percentage (11.94%) was on Friday, possibly due to patients' delay in presenting to specialist services in the hope that their injuries did not require specialist treatment.

Figure 2: Share by days of the week of patients with cranio maxillo facial trauma.



DISCUSSIONS:

The objective of this paper, was to analyze the cranio maxillo facial trauma in the Sibiu Emergency County Hospital over a period of 4 years, between 2014 and 2017.

From the perspective of the gender of patients presenting with these types of trauma, an overwhelming percentage was occupied by male patients, our results being largely aligned with other similar studies present in the literature.

In terms of the etiology of these cranio maxillo facial traumas, analyzed in the present study, accidental falls, followed by assaults and motor vehicle accidents were ranked first. This is also consistent with the etiology of these injuries both nationally and globally [97].

This can be explained by the fact that today's society is in a constant state of flux, and everyday stress takes its toll on the vast majority of the population, which is why these patients suffer these types of accidental injuries. Interpersonal violence is also on the rise globally and the level of education in our country is at a fairly low level, which is why these patients are involved in these assaults.

From the breakdown of patients in 3 age groups, it was observed that people aged between 20 and 40 years are the most prone to these types of trauma, probably due to the fact that they are more involved in more types of activities in social life, the desire for affirmation at this age is greater.

It was observed that urban males were the most prone to these types of cranio maxillo facial trauma, although this increasing trend of males can also be observed in rural areas.

Most patients with cranio maxillo facial trauma presented to the Sibiu County Emergency Hospital on Mondays, which is probably explained by the postponement of their presentation to the hospital during the weekend and by the fact that on weekdays they tend to be involved in more activities that can cause these pathologies.

The highest percentage of patients presenting with these types of trauma was represented by salaried patients, from which we can say that people who have a job and are much more active, compared to people who are not so much involved in socio-professional life, are much more prone to cranio-maxillofacial trauma.

CONCLUSIONS:

1. Male patients suffered the most cranio maxillo facial trauma.
2. The most common etiology in the occurrence of these types of trauma was accidental falls, interhuman aggression and motor vehicle accidents.
3. People aged between 20 and 40 years were most prone to cranio maxillo facial trauma.
4. Urban environment and male sex were the leading patients with cranio maxillo facial trauma.
5. Most patients with cranio maxillo facial trauma presented to the Sibiu County Emergency Hospital on Monday.
6. Salaried patients who have a job were the most prone to these traumas.
7. Most of the patients who presented to the Sibiu Emergency County Clinical Hospital accepted the proposed treatment.
8. The most common symptoms were eating difficulty and acute pain.

Study II: Economic analysis of maxillofacial trauma in Sibiu Emergency County Clinical Hospital between 2014-2017.

INTRODUCTION:

Study II is also based on a descriptive analysis of the costs required for the assessment and management of patients with cranio maxillo facial trauma, also over a period of 4 years, between 2014-2017, analysing different types of costs depending on the pathologies presented, correlations between the costs of different types of fractures found on the same anatomical segment, certain comparisons between different methods of treatment of the same pathology.

Due to their severity and complexity, these injuries are often associated with high morbidity, loss of function and high aesthetic, social and economic cost, with impact on quality of life.

In very many cases of head injuries, in addition to the primary treatment for the fracture in question, a second or multiple surgical interventions are often required to repair sequelae in the affected region, which can involve very high costs.

This is why we consider this study to be of great importance, in order to track the costs of treating various fractures in the cranio-maxillofacial region, with the aim of increasing the quality of medical care and making it more efficient, so that the patient receives the best treatment, with the best results and also with the lowest costs for the hospitals treating these types of pathologies.

MATERIAL AND METHOD

Study number II is also a retrospective study, conducted over a period of 4 years, between 2014 and 2017, and aims to track and compare the costs of cranio maxillo facial trauma, of patients admitted with these types of pathologies in the Sibiu County Emergency Hospital during this period.

This study was carried out with the help of data provided by the central statistics office of the Sibiu County Emergency Hospital, data collected in most cases from the patients' discharge notes and their statements.

Thus a correlation was made between the different types of cranio maxillo facial trauma and the costs that were necessary to treat them, throughout the duration of hospitalisation.

The entire group of patients in this study fell into the category of the insured, receiving state or private health insurance at no cost.

RESULTS:

We analyzed the average costs of patients admitted to SCJU Sibiu between 2014-2017 with mandibular body fractures, subcondylar fractures and double mandibular fractures (per patient).

The highest average costs (2264, 222 RON), were recorded in patients with double mandible fractures, due to the need for more osteosynthesis materials, compared to mandibular body fractures (1605,632 RON) and subcondylar fractures (1512,965 RON).

Also postoperative care of patients with double mandible fractures may be more complex and of longer duration compared to subcondylar fractures and mandibular body fractures.

Table 1: Breakdown of average costs of patients admitted to SCJU Sibiu between 2014-2017 with mandibular body, subcondylar and double mandible fractures (per patient).

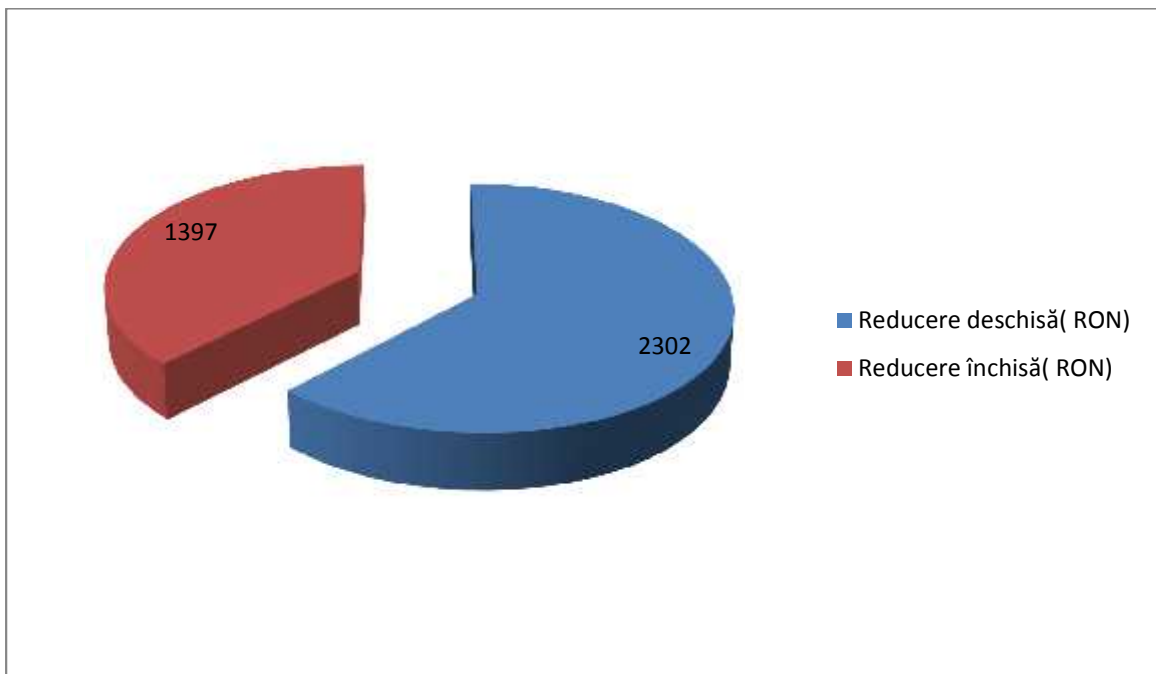
MANDIBULAR BODY FRACTURE	1605,632 RON
DOUBLE MANDIBULAR FRACTURE	2264,222 RON
SUBCONDYLAR FRACTURE	1512,965 RON

We studied the cost-effectiveness ratio for mandible fractures of patients admitted to SCJU Sibiu during the study period between open reduction and osteosynthesis of fractures.

Normally in case of open reduction and osteosynthesis of mandible fractures more expensive materials are needed to perform the manoeuvre and the average costs are higher (2302 RON) than closed reduction (1397 RON).

Closed reduction of mandible fractures requires minimal materials and in most cases is performed under local anaesthesia, reducing costs compared to general anaesthesia required for open reduction.

Figure 3: Cost-effectiveness analysis for the treatment of mandible fractures of patients admitted to SCJU Sibiu between 2014-2017 (per patient).



From our study a number of 108 patients presented fractures of nasal proper bones, being some of the most common fractures in the viscerocranium due to the prominent positioning of the nasal pyramid which is often exposed to different types of trauma. The total cost of treating these types of pathologies during the study period was 85117,28 RON. However, the average cost per patient was quite low (788, 122 RON), which can be explained by the closed reduction in most cases of these types of fractures and their favourable evolution.

Table 2: Analysis of patients who suffered fractures of the nasal own bones, average cost of these types of pathologies per patient and total cost during 2014-2017

NUMBER OF PATIENTS	108
AVERAGE COST	788,122 RON
TOTAL COST	85117,28 RON

Malar fractures were also common in our study in 76 patients and the average cost per patient was 1409.547 RON.

Table 3: Analysis of patients who suffered malar fractures and orbital plane fractures and the average cost of these types of pathologies per patient during 2014-2017

FRACTURE TYPE	MALAR	ORBITAL SLAB
AVERAGE COST	1409,547	2476,1
TOTAL PATIENTS	76	8

Orbital plateau fractures are a complex pathology, often requiring an interdisciplinary approach between maxillofacial surgeon and ophthalmologist, and their reconstruction techniques use titanium reconstruction meshes or bone grafts, or resorbable membranes, materials with a high cost, which may explain the high average cost of these fractures (2476 RON).

DISCUSSIONS:

Cranio maxillo facial trauma, is an extremely complex pathology, both medically and financially.

According to our study, the highest costs (average of 2264 RON), were seen in patients who presented double mandible fractures, which can be explained by the fact that these types of fractures require more osteosynthesis materials to be treated, compared to the necessary costs of a subcondylar fracture which most of the time requires only one osteosynthesis plate.

There were also significantly higher costs for fractures treated by open reduction compared to fractures treated by closed methods, which makes sense in that fractures treated by open methods require much more osteosynthesis material.

The development of economic evaluation techniques can use up much more resources and costs for healthcare systems, which is why a very detailed analysis of alternatives is needed.

The complexity of skull vault and skull base fractures also marks the highest costs analysed in this study, which is explained by the complexity of diagnosing and treating these types of trauma, as well as the complex post-operative care.

These costs can also be explained by the fact that the duration of hospitalisation is much longer for skull and skull base fractures than for the other cranio maxillo facial injuries.

According to our study, the most frequent fractures of the viscerocranium were fractures of the nasal proper bones, which is explained by the fact that these anatomical elements have a prominent positioning that makes them susceptible to these traumas.

Also the comparison made in this study, between orbital plane fractures and malar fractures, of which the orbital plane fractures required much higher costs, can be explained by the fact that the reconstruction of these fractures requires very expensive materials and also interdisciplinary collaborations, between the maxillofacial surgeon and the ophthalmologist.

CONCLUSIONS:

1. Double mandible fractures were the pathologies requiring the highest costs.
2. Open fracture reductions required significantly higher costs than closed reductions.
3. The most common viscerocranial fractures were nasal bone fractures.
4. Orbital plate fractures required significantly higher costs than malar bone fractures.
5. Skull vault fractures had significantly higher costs than skull base fractures.

STUDY III: IMPACT ON THE QUALITY OF LIFE OF PATIENTS WITH CRANIO MAXILLO FACIAL TRAUMA

INTRODUCTION:

Post-traumatic stress disorder (PTSD) is a health problem that some people develop as a result of exposure to tragic events such as car accidents, human-on-human assaults, natural disasters, sexual abuse.

The disorder is characterized by: anxiety, nightmares, insomnia, flashbacks, difficulty concentrating, irritability, anger, isolation, detachment from reality, sadness, guilt, refusal to reintegrate into society[104].

Study III, aims to analyze the results of a standardized questionnaire HADS (Hospital anxiety and depression scale), the degree of depression or anxiety of patients who suffered cranio maxillo facial trauma during 2020.

This questionnaire was applied to patients without psychiatric disorders who suffered cranio maxillo facial trauma during 2020, and aims to capture the influence on quality of life of these types of pathologies, in particular to track the degree of depression or anxiety resulting.

MATERIAL AND METHOD:

Frequency tables and indicators of central tendency (mean-M and standard deviation-SD) were used to analyze the data obtained from the application of the HADS questionnaire, both for each individual item and for the scores of the two subscales (depression and anxiety). For the validation of the two subscales of the questionnaire, the factor analysis technique - principal component analysis - was used. The Kolmogorov-Smirnov test was used to test the normality of the data. For the comparative analysis of the two types of fractures, in terms of the two subscales, the Student's t-test was used for two independent samples. Correlation analysis, using Pearson correlation coefficient, was used to analyse the possible existence of a link between the two subscales, both for the whole group and for the two fracture types. The significance level considered was 0.05 and the software used for data analysis was SPSS.

The questionnaire comprises a total of 14 questions, with questions targeted to assess the degree of depression or anxiety, and is structured with responses in two columns, each response

having a score from 0 to 3. At the end the score is grouped into three ranges (0-7, 8-10, 11-21) and classifies the presence of depression or anxiety.

A total group of 24 patients ,who presented to the oral and maxillofacial surgery department was included and was divided into two subcategories, namely patients who presented with fractures of nasal proper bones and patients with mandible fractures.

The aim of this questionnaire is to compare the repercussions of two common types of fractures in the oro maxillo facial sphere, respectively to observe the degree of anxiety or depression that these patients who have suffered these types of injuries may acquire.

RESULTS:

Out of a total of 24 patients who answered the questionnaire during this study, 19 patients were male, while only 5 were female.

This interesting aspect, comes to outline our conclusions from study I, according to which, traumatisms of the cranio maxillo facial sphere are much more frequent in male patients, probably due to their involvement in more socio-professional activities, making them more exposed to these types of traumatisms.

We observed a number of 15 patients in the analyzed group who had anxiety scores above the normal limit, 12 of which were male and 3 female.

We can thus conclude that these types of pathologies in the cranio maxillo facial sphere, produce an impairment of quality of life and a strong impact on the patient, probably due to the fact that the cephalic extremity is a richly innervated area, which can often present scarring, or impairment of aesthetic, functional and cognitive functions that affect the quality of life of patients.

Figure 4: Depression scale and anxiety scale scores for the whole group

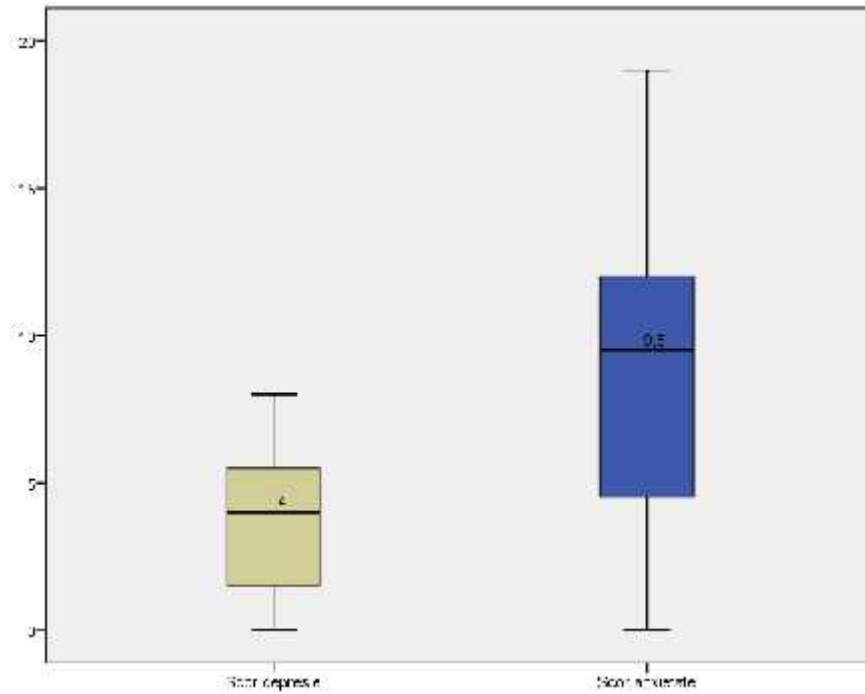
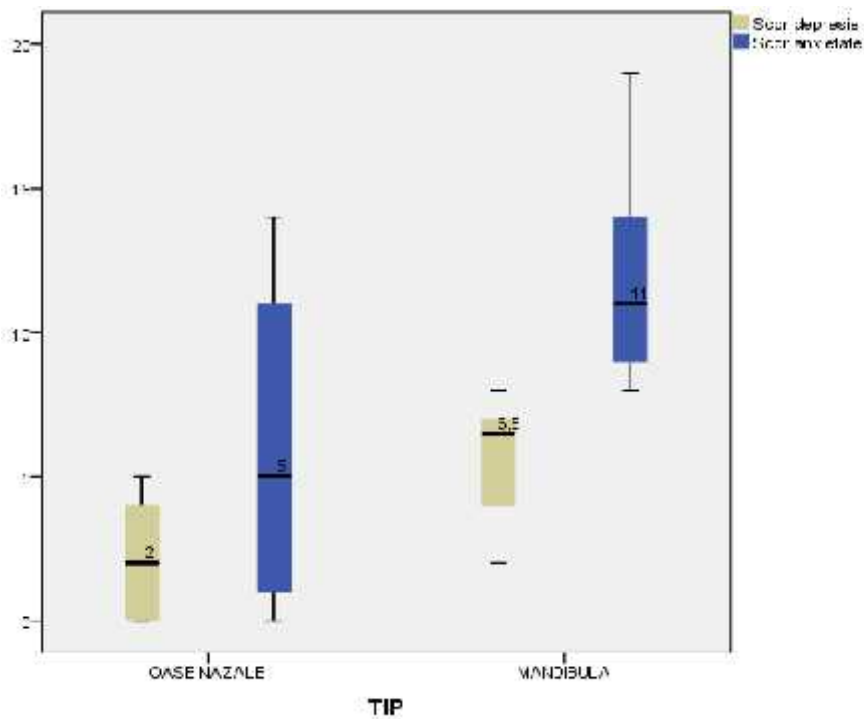


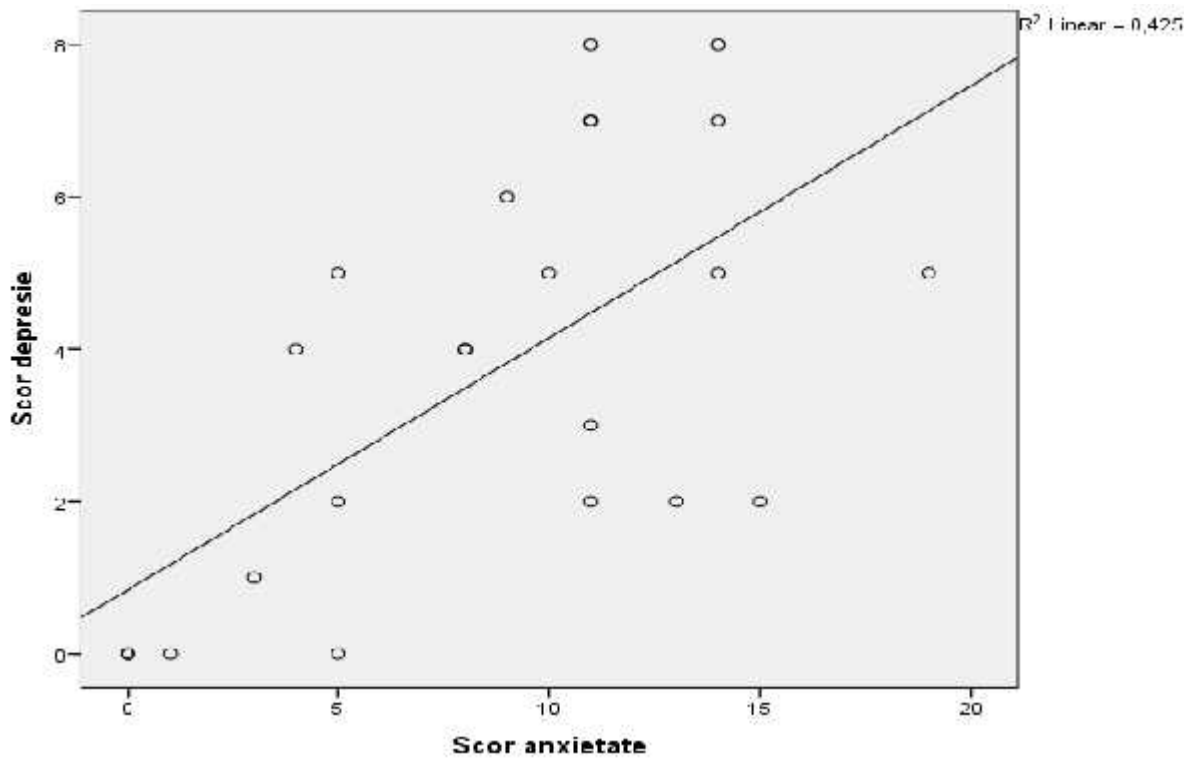
Figure 5 : Depression scale and anxiety scale scores, comparative analysis between patients with jaw fractures and those with nasal bone fractures.



The correlation analysis between the score obtained for the depression scale and the score obtained for the anxiety scale indicates the existence of a direct, statistically significant link ($r = 0.652$, $p = 0.001$) between the two scales at the level of the whole group. Thus, it can be said that patients who have low scores on the anxiety scale also have low scores on the depression scale (patients who are not anxious are not depressed) and patients who have high scores on the anxiety scale also have high scores on the depression scale (patients who are anxious are also depressed).

If this correlation is then analysed for patients with nasal bone fractures and for patients with mandible fractures, the direct, statistically significant correlation is observed only for patients with nasal bone fractures ($r = 0.646$, $p=0.012$).

Table 4: Correlation anxiety score depression score



Analyzing the scores obtained for the two subscales of the HADS questionnaire, we observe an average of 3.62 (SD=2.72) for the depression scale and 8.42 (SD=5.35) for the anxiety scale. The values obtained for the depression scale as well as the central tendency indicator are less than or equal to the value 8 which is at the limit of normal values while more than 50% of the values obtained for the anxiety scale exceed the normal limit.

Comparative analysis of the two types of fractures shows that in patients with mandible fracture both depression and anxiety scores are significantly higher than in patients with nasal bone fractures (depression score: 5.80 ± 1.99 vs. 2.07 ± 2.02 , $p=0.000$; anxiety score: 12.00 ± 3.50 vs. 5.86 ± 5.02 , $p=0.000$).

Table 5: Descriptive analysis of the two subscales, for the whole batch and for the two types of fractures respectively

		N	%	M±SD	NASAL BONE	MANDIBLE
Depression score	0	5	20,83%	3.62±2.72	2.07±2.02	5.80±1.99
	1	1	4,17%			
	2	4	16,67%			
	3	1	4,17%			
	4	3	12,50%			
	5	4	16,67%			
	6	1	4,17%			
	7	3	12,50%			
	8	2	8,33%			
Anxiety score	0	3	12,50%	8.42±5.35	5.86±5.02	12.00±3.50
	1	1	4,17%			
	3	1	4,17%			
	4	1	4,17%			
	5	3	12,50%			
	8	2	8,33%			
	9	1	4,17%			

	10	1	4,17%			
	11	5	20,83%			
	13	1	4,17%			
	14	3	12,50%			
	15	1	4,17%			
	19	1	4,17%			

For the validation of the two subscales (depression and anxiety) of the HADS questionnaire, the multivariate analysis method - factor analysis - was used.

The value of the KMO (Kaiser-Meyer-Olkin) index being 0.540 indicates the adequacy of the analysed items for factor analysis. The value of Bartlett sphericity test (232.828, p=0.000) also indicates the existence of correlation between the questionnaire items.

Table 6: Component matrix (obtained by rotating the factor axis marker)

Rotated Component Matrix^a					
	Component				
	1	2	3	4	5
i6	,902	-,135	,099	,061	,145
i8	,873	,181	,101	,018	-,245
i4	,831	,295	,087	-,035	-,146
i10	,806	,213	,249	,201	,023
i2	,725	,514	,054	,131	-,058
i5	,297	,809	-,009	,179	-,270
i11	,004	,735	,138	,450	,340
i9	,311	,555	,084	-,502	,350
i3	,419	,177	,813	,085	-,008
i1	,456	,230	,725	,063	-,091
i7	,343	,364	-,706	,064	,163
i14	,019	,152	,119	,821	,196

i12	,519	,221	-,099	,771	-,057
i13	-,130	-,003	-,154	,131	,910
Extraction Method: Principal Component Analysis.					
Rotation Method: Varimax with Kaiser Normalisation.					
a. Rotation converged in 11 iterations.					

DISCUSSIONS:

Interesting to note, according to the results of this questionnaire, is that none of the patients developed symptoms of depression after these cranio maxillo facial traumas, which can be explained by the relatively small number of patients with these types of pathologies that we were able to analyze during this period.

We can also conclude that these types of traumas rather affect the patient's quality of life by creating a fear, an anxiety, in order to repeat these types of traumas [100-103].

These results may be useful for training health units dealing with the treatment of these types of pathologies to provide the psychiatric and psychological support that some patients with these types of pathologies require.

Anxiety is an important factor today and refers to excessive and uncontrollable worries about everyday life events.

It occurs at an incidence rate of about 5-9% of the population, and the incidence is twice as high in women as in men.

People with generalised anxiety experience major challenges in all segments of daily life as well as in carrying out tasks at work or at home.

CONCLUSIONS:

1. From the results of this study, on the group of patients analyzed, it was found that patients showed a small percentage of depressive symptoms after oro maxillo facial trauma.
2. Anxiety was the dominant symptom in these oro maxillo facial trauma patients.
3. The majority of patients who presented with anxiety according to this study were male.
4. Fractures of the mandible had a much higher frequency than fractures of the nasal proper bones.
5. Mandible fractures were dominant in male patients.
6. Fractures of the mandible generated anxiety at a higher rate than fractures of the nasal proper bones.
7. The majority of female patients had fractures of the nasal own bones and a small percentage had fractures of the mandible.

GENERAL CONCLUSIONS:

This thesis, comprises three main studies, through which it was intended to analyze trauma in the cranio maxillo facial sphere, as a public health problem and as an impact on the population of Sibiu County.

In the first study, these traumas were analysed over a period of 4 years, between 2014-2017, and aspects related to incidence, analysis by sex, by environment, by aetiology, certain correlations between sex and environment, frequency of patient presentation by days of the week and breakdown by quarters of the year were followed.

The performance indicators of the Oral and Maxillofacial Surgery Department of the Sibiu Emergency Clinical County Hospital were also analysed, referring to days of hospitalisation, mortality, frequently used antibiotics, frequent symptoms of these patients, as well as the average length of hospitalisation.

It was observed that in Sibiu county, there is a high proportion of these traumatic injuries in the cranio maxillo facial sphere, both in rural and especially in urban areas.

At the same time, the Sibiu County Emergency Clinical Hospital has the capacity to take in and treat these types of complex trauma, both in terms of staff and technical equipment. Obviously there is room for improvement and through this study, we want to contribute to a better efficiency and to increase the quality of the medical care necessary to treat these patients.

Also in the second study, we tried to break down the average costs necessary for the treatment of these types of pathologies and we can see that the Sibiu County Emergency Hospital allocates considerable amounts annually for these pathologies. It is possible that through a detailed analysis, the hospital will discuss possibilities for reducing and making these costs more efficient, in order to obtain the most effective quality-price ratio.

In study three, we tried to track the impact on the quality of life of patients who have suffered cranio maxillo facial trauma, by applying a standardized questionnaire, type HADS, which aims to assess the degree of depression or anxiety of these patients.

Interestingly, these types of trauma, in the cranio maxillo facial sphere, caused mostly anxiety among patients. Through this study, we want to contribute to improving the treatment of these pathologies also from a psychological or psychiatric point of view, perhaps by including post-trauma therapies in the basic protocols for these cases.

Of course, this study had some limitations, many patients were not able to fill in the questionnaires correctly even though they had the necessary instructions and were explained to them by trained medical staff, and some of them were not able to understand these questions effectively, probably due to the fact that many of them were poorly educated.

RESEARCH DEVELOPMENT PERSPECTIVES:

Our proposals are focused on the development of stand-alone oral and maxillofacial surgery departments in county or municipal hospitals, because in Romania there is a deficit in this specialty, both in terms of infrastructure and human resources, and the hospital units provide greater importance to these types of pathologies, which as we have seen in this paper, can have very serious consequences and also very high costs to treat them.

The present work can also contribute to decisions on the development of treatment protocols for these pathologies, providing relevant information on the management of cranio-maxillo-facial trauma, the various costs of treating these pathologies and the assessment of the quality of life of patients who have suffered such trauma.