COLLEGE OF MEDICINE AND HEALTH SCIENCES

DELAY IN CRANIOMAXILLOFACIAL TRAUMA CARE AT UNIVERSITY TEACHING HOSPITAL OF KIGALI (CHUK)

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College of Medicine and Health Sciences

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DELAY IN CRANIOMAXILLOFACIAL TRAUMA CARE AT UNIVERSITY TEACHING HOSPITAL OF KIGALI (CHUK)

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Supervisor: Dr NCOGOZA Isaie
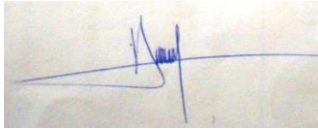
SEPTEMBER , 2021

DECLARATION

Researcher:

I hereby declare that the dissertation titled:" **Delays in craniomaxillofacial Trauma care at University Teaching Hospital of Kigali (CHUK)**" is my own work and has not been submitted to any University in Rwanda for the award of any degree.

Signed   Date 13/12/2021

Dr NIYIGABA Gilbert

Supervisor:

I hereby declare that this dissertation has been submitted with my approval as supervisor.

Signed   Date 13/12/2021

Dr. NCOGOZA   Isaie

DEDICATIONS

To the almighty God

To my beloved parents

To my loved wife

To my friends and relatives

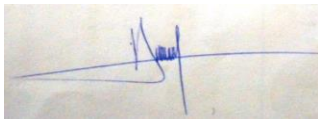To my teachers and coworkers

This work is dedicated.

ABSTRACT

Introduction

Craniomaxillofacial (CMF) trauma comprises a significant proportion of global surgical disease burden, disproportionally impacting low and middle-income countries where care is often delayed. We investigated the reasons for delay in CMF trauma care and the effect on patient outcomes.

Methodology

This was a cross-sectional prospective study of all patients with diagnosis of CMF trauma presenting to the University Teaching Hospital of Kigali (CHUK) between June 1, 2020 and June1, 2021. It enrolled 54 participants. Epidemiologic data was collected, and logistic regression analysis was undertaken to explore risk factors for delays in care and complications.

Results

Male accounted for 51 (94.4%) of CMF trauma cases. Mean age was 30 years (range 4 - 65 years). The majority of patients presented from a rural setting (63% n=34), the most common cause of trauma was motor vehicle accident (n=18, 33%), and the most common injury was mandibular fracture. 78% of patients had delayed treatment of their fracture after arrival to the hospital, 81% of these patients with delayed treatment experienced a complication (n=34, chi-squared p=0.03). Delay in treatment was associated with 4 times greater likelihood of complication (OR 4.25 (95% CI 1.08-16.70, p=0.038).

Conclusion

Delay in treatment of CMF traumatic injuries correlates with higher rates of post-operative complications. Delays most commonly resulted from lack of surgeon and/or operating room availability, or were related to transfers from rural districts.

Keywords: Delays, craniomaxillofacial trauma, care

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ABBREVIATIONS

CHUK: University Teaching Hospital of Kigali

UR: University of Rwanda

CMHS: College of Medicine and Health Sciences

HIV: Human Immunodeficiency Virus

AIDS: Acquired Immuno Deficiency Syndrome

LMIC: Low and Middle Income Country

GCS: Glasgow Coma Scale

RTA: Road Traffic Accident

OR: Odd Ratio

CI: Confidence interval

ORIF: Open Reconstruction and Internal Fixation

MMF: Mandibular maxillary fixation

CMF: Craniomaxillofacial

DELAYS IN CRANIOMAXILLOFACIAL TRAUMA CARE AT THE UNIVERSITY TEACHING HOSPITAL OF KIGALI (CHUK)

I. BACKGROUND

The face, head and neck are extremely prominent areas on the body that are vulnerable to trauma[1]. Craniomaxillofacial trauma and fractures significantly contribute to global diseases and is a burden to low and middle income countries (LMIC) that causes about 5 million deaths per year[2,3].

Around 10% of deaths worldwide are from trauma and this is more than HIV/AIDS tuberculosis and malaria combined. Congested traffic , high prevalent of motorcycles, underdeveloped safety infrastructures and high alcohol usage are associated with high incidence of injury [4].

Young people (21-30 years) are the most affected by craniomaxillofacial trauma and males are affected more than female [5,6,7]. This has a significant impact on health and socio-economic system in general as for every death, 40-50 persons suffer permanent disabilities (poverty , mental unfitness) for the injury [4,6,1,8].

Across the world road traffic accident has been reported as the main cause of craniomaxillofacial trauma either by motorcycles or cars and the influence of alcohol has been reported [9,10,11,12] . Apart from road traffic accidents, assaults have been reported as the main cause of craniomaxillofacial trauma [13,12]. In the study done in UK in 2015, assault due to alcohol were the main cause in 61% [14]. In Australia 2012 assault were the main cause of nasal bone fracture with the incidence of 58.6% [9,15]. In low income countries mainly Africa the craniomaxillofacial trauma/fractures are associated with road traffic accidents and assaults with the influence of alcohol abuse [16,17,18,8,19 ,20,1,21,9,10,11,12,10,6,22] and mandibular fracture as the main fractured bone [22,23,5,19,18,10,1]. Other Reported causes of craniomaxillofacial trauma include falls , gunshot , industrial , accident, sport animals, iatrogenic [17,19]. The most common associated injuries are traumatic brain injuries , thoracic injuries, pelvic and abdominal injuries [13,23].

The delay care in Maxillofacial trauma patients has been defined as it is when the treatment is done after 3 days of trauma /fracture [23].

Time to care is different due to various factors including time , location and socioeconomic status: the Study done in Kaduna/Nigeria in 2019 showed that more than 70% of patients looked for treatment 1 month post injury [5,16] , 6% consulted between 1month to 6 months [16] . Study done in South Africa 2013 showed mean of 10.3 days from fracture to presentation to hospital [11] and mean time of 20.3 days from facial fracture to definitive care [4,11] This has been attributed to bed availability and associated with risk of complications [4,23] .

In Massachusetts , the majority of fractures repaired between 3 to 10 days from hospital presentation where the mean time was 6.5 days [23].

The causes of delay to care include a surgical workforce crisis in LMICs , financial and equipment [23] .

Study done in Nigeria /Kaduna showed the cause of delay was ignorance , long distance to hospital , priorities given to other serious injuries, failure to diagnose facial fractures in some specialties , lack of facilities in nearest dental services [16] while study done in South Africa 2013 showed that economy difficulties and hangover from alcohol delay recognition of seriousness of injury [11]. Study done in Lexington 2017 showed once the patients arrive at the hospital , the delay care can be associated with other factors including the preoperative status of the patients like low GCS   and the type of fracture like Lefort fractures [23].

Closed reduction and immobilization techniques are common used in LMICs while in high income countries they use the state of art devices and techniques [4]. The treatment of maxillofacial trauma must be performed in a timely manner and delay in care can result in improper healing, complication, disabilities and death [23,11]. Rdabagauh and al in 2017 showed that patients were treated   5 days post maxillofacial trauma and complication rate was 13.6% and half of them were infection [23]. Study done in Nigeria in 2017 showed that there was complication rate of 35.5% on patients treated after 3 days of trauma [24]. Study done   in UK (2015) found that craniomaxillofacial fracture treated within 72 hours had no contamination and infection [14].

Other complications associated with delay care of maxillofacial trauma have been reported and were   mostly infection   , non-union, delayed union , trismus , facial deformities, facial palsy , transient diplopia, chronic pain , malunion , malocclusion [5].

II. JUSTIFICATION OF THE STUDY

Proper CMF fracture care requires a trained CMF surgical workforce, diagnostic and treatment facilities and materials for rigid internal fixation . Deficiencies in any of these may result in delays in care, defined as no treatment for at least three days following the inciting event[23]. Delays increase the risk of complications such as infection, nonunion, malunion, trismus, pain, and malocclusion [25]. Elucidating reasons for delays in CMF care is critical to improving care in LMICs. Rwanda, is described by the World Bank as a low-income country [26] and has 2 maxillofacial surgeons per 13,000,000 population . All CMF trauma patients are referred by the district hospitals to two tertiary referral centers located in the capital city of Kigali and the University Teaching Hospital of Kigali (CHUK) is the largest of the tertiary hospitals in the country. This shortage of surgeons and number of population may be associated with some delays in management of craniomaxillofacial trauma patients. We aim to characterize the delays and associated factors for delays in management of CMF trauma patients at CHUK.

III.OBJECTIVES

III.1.Main objective

To determine the reasons and associated factors for delay in management of CMF trauma patients at CHUK.

III.2.Specific objective

a. To identify the sociodemographic characteristics of CMF trauma patients .
b. To describe the characteristics of CMF injuries.
c. To determine the causes of delay in management of CMF trauma patients.
d. To determine the complications related to delays in CMF trauma patients'care.

IV.RESEARCH QUESTION

What are the reasons and factors associated with the delay in management of CMF trauma patients at CHUK?

V. METHODOLOGY

V.1.Study design, Setting and duration of the study

This is cross-sectional , descriptive prospective study conducted at the University Teaching Hospital of Kigali (CHUK), involving CMF patients during a period of 1year, from June 2020 to June 2021.

V.2. Sample size

The study done in 2017 by Lallo et al showed that the standardized prevalence of craniomaxillofacial fractures was ranging from 1.4% to 4.1% [27] . Based on the data of emergency department CHUK, the overall annual trauma was 1800 patients while craniomaxillofacial trauma incidence found to be 3.7% accounting around 65 patients . Referring on this study done by Lallo et al with prevalence ranging from 1.4% to 4.1%, we took 3.7% as reasonable prevalence to give us the reasonable number of patients to be recruited in this study.

Sample size was calculated using Fischa formula : $\mathbf{Z^2a * p(1-p)/ e^2} = (1.96)^2 *0.037(1-0.037)$ / $0.0025 = \mathbf{54}$ patients   Where $\mathbf{Za} = 1.96$, $\mathbf{p}$: prevalence= 3.7% , $\mathbf{e}$= 0.05

V.3. Inclusion criteria

The current study included all patients who consulted CHUK for craniomaxillofacial trauma.

V.4.Exclusion criteria

The following were excluded from the study:

- Patients who refused to consent for the study.
- Patients with low GCS and without the care taker to provide relevant information.

V.5.Data collection

Data were collected by the investigator using a pre-established data collection sheet. The information recorded was about socio-demographic status, cause of craniomaxillofacial trauma, characteristics of injury, characteristics of delays and reasons for delay to arrive at CHUK , delays for treatment and reasons , type of treatment provided and types of complication around the treatment period.

A map of geographic distribution of trauma patients was created by calculating the direct distance from the center of the patient's home district to the University Teaching Hospital of Kigali using Google Maps version 9.135.0.3.

V.6. Sample treatment and data analysis

Statistical analysis were carried out in STATA v16.1. A complete case analysis was undertaken; no participants had any missing data , we calculated crude and adjusted odds ratios with 95% confidence intervals (CI) to explore the relationship between delays in diagnosis or treatment with complications.

Covariates for multivariable models were selected based on clinical relevance, mean and p value was calculated.

V.7. Ethical consideration

Approval for this study was successively granted by UR/CMHS Institutional Review Board (No. 134/CMHS IRB/2020) and University Teaching Hospital of Kigali Institutional Review Board. Patient or guardian signed the written consent prior to the data collection, the information was confidentially protected and plagiarism was avoided.

VI.RESULTS

VI.1. Sociodemographic characteristics

Table 1. Sociodemographic characteristics

	n	%
Sex		
M	51	94.4
F	3	5.6
Age (years)		
<15	4	7.4
15-30	25	46.3
31-45	19	35.2
46-60	3	5.6
>60	3	5.6

Mean	30years	
Range	4-65	
Origin		
City	20	37.0
Rural	34	63.0
Mean Distance from the hospital (Km)	33	
Socioeconomic Category		
1	4	7.4
2	21	38.9
3	28	51.9
4	1	1.9

Table1 shows the socio-demographic characteristics of the participants. A total of 54 patients met criteria for inclusion in the study. 51 (94.4%) were men. Mean age was 30 years (range 4-65 years). The majority of patients presented from a rural setting (63% n=34), with a mean distance traveled to the hospital of 33km (SD 28km, range 4-102km (Figure 1). The majority of patients were of socioeconomic class 3 (51.9%).

*F*igure1: **Number of Patients traveling from home district to CHUK**
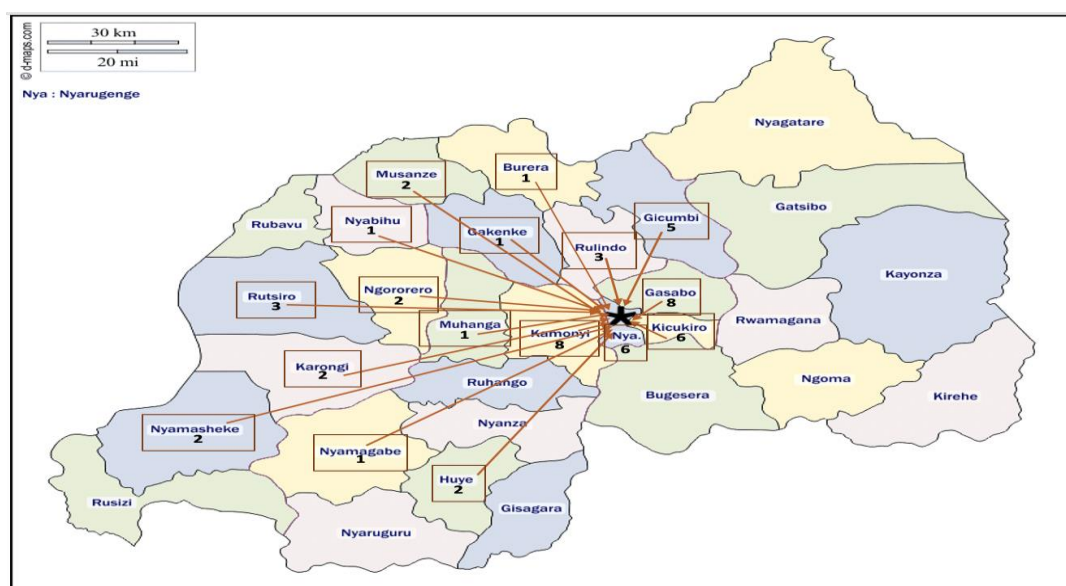
Figure 1 shows the number of patients traveling from home district to CHUK.

The majority of patients presented to CHUK from a rural setting (63% n=34), with a mean distance traveled to the hospital of 33km (SE 3.9) where Gasabo and Kamonyi districts have 8 patients each. For every 1 km increase in distance from the hospital, patients are 1.03 times more likely to have a delayed arrival.

For example, a patient with 10km distance from the hospital the odds are 10.3x greater that they will have delayed presentation (OR 1.03 95% CI 1.005-1.06, p=0.018) but after controlling for distance in km this association becomes slightly less significant (OR 5.4, 95% CI 0.95-31.20, p=0.058).

Patients were 5.8 times more likely to have delayed arrival to the hospital if originating from a rural setting (OR 5.85 95%CI 0.67-50, p=0.10) where 34(63%) patients come from rural area.

VI.2. Cause of CMF trauma

Table 2. Cause of CMF trauma

Cause of Trauma	N	%
Assault	16	29.6
Bicycle	14	25.9
Fall	1	1.9
Motorcycle	18	33.3
Mining	1	1.9
Motor vehicle	4	7.41
Alcohol reported on arrival		
No	44	81.5
Yes	10	18.5

Table 2 shows the causes of CMF trauma. Motorcycle accidents were the most common cause of trauma (n=18, 33%) followed by assault (n=16, 29.6%). 18.5% of patients reported use of alcohol at time of injury.

VI.3. Characteristics of the Injury

Figure 2: *Injury Characteristics*
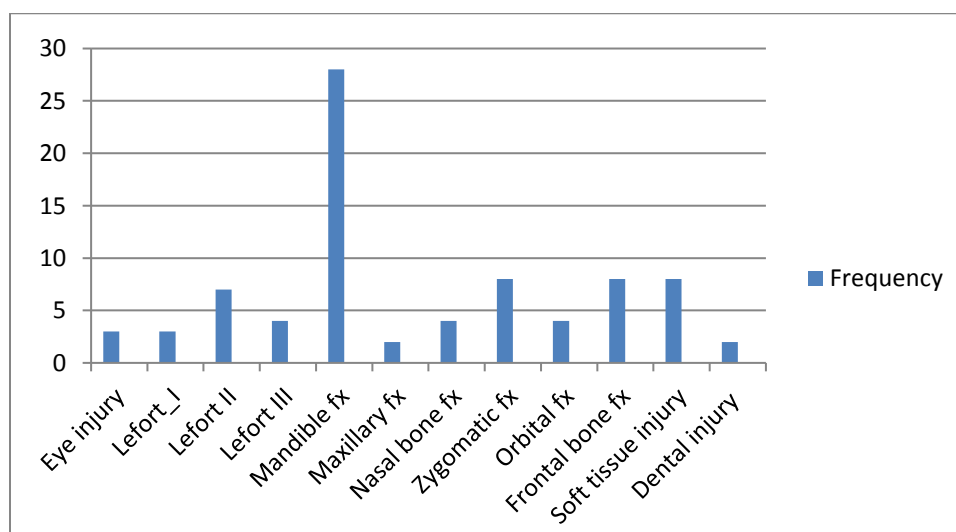
Figure 2 shows the characteristics of CMF injury. The most common fracture site was the mandible (n=28, 51%) followed by zygomatic and frontal bone fracture (n= 8) and Lefort II fracture (n=7). Of those with mandible fractures, three had associated traumatic brain injuries, four had limb fractures and one had a pelvic fracture.

VI.4. Characteristics of the delay, reasons of day and treatment of CMF injury

Table 3. Characteristics of the delay, reasons and treatment of CMF injury

Characteristic of the delay	n	%
Delayed presentation to the hospital		
No	45	83.3
Yes	9	16.7
If yes: Reason for delay of arrival		
Delayed diagnosis	2	22.2
Delayed referral	4	44.4
Economic difficult	3	33.3
Time between injury and arrival		
<1 day	39	72.2
1-3 days	6	11.1
4-7 days	6	11.1
>7 days	3	5.6
Delayed treatment, after presentation		
No	12	22.2
Yes	42	77.8
If yes: Reason for delay of treatment		
Admission to ICU	2	4.8
Associated injury	1	2.4
Material unavailability	23	54.8
Neglected	1	2.4
Surgeon unavailability	15	35.7
Time between arrival to hospital and treatment		
<1 day	3	5.6
1-3 days	9	16.7
4-7 days	28	51.9
>7 days	14	26.0
How injuries were treated?		
Mandible fracture		
Conservative treatment	8	28.6
Closed Reduction (MMF)	10	35.7
ORIF	10	35.7

Table 3 shows the characteristics of the delays. The majority of patients presented within one day of their injury. Nine patients (16.7%) had delayed presentation to the hospital, defined as presentation greater than three days after injury. Of the nine patients having delayed presentation to the hospital 4 delayed to be transferred to CHUK and 3 had economic issues.

77.9% of patients had delayed treatment of their fracture after arrival to the hospital, defined as more than three days between arrival and treatment (n=42). The majority of patients (51.9%) were treated within 4-7 days, however 26% of patients had treatment delays for more than 7 days. The most common cause of delay was material not being available (n=23, 54.8%), followed by lack of surgeon or operating room availability (n=15, 35.7%). Treatment of mandibular fractures was varied. Eight patients were treated with conservative management, such as soft diet and physical therapy, 10(35.7%) with closed reduction/maxillomandibular fixation (MMF), and 10 (35.7) with open reduction internal fixation (ORIF).

VI.5. Types of complications

Table 4. Types of complications

Complications of Mandible Fracture	n	%
None	7	25
Malocclusion	5	17.9
Infection	1	3.6
Trismus	14	50
Malunion	1	3.6

The most common complication in mandibular fracture treatment was residual trismus, which was reported in 14 patients immediately post-treatment, nine of whom were treated with MMF, 5(17.9%) patients had dental malocclusion.

VI.6. Association between the delay, factors for delay and complications in CMF trauma patients

Table.5. Association between delay, factors for delay and occurrence of complications

Variables	Odds Ratio	p-value	Confidence interval (95%)
Arrival to hospital >3 days after injury and Complications	1.5	0.64	0.27 – 8.09
Originating from a rural setting and Delayed arrival to hospital	5.85	0.10	0.67 – 50.00
Every 1 km increase in distance from hospital and Delayed arrival	1.03	0.018	1.005 – 1.06
Alcohol intake at injury and Delayed arrival to hospital	5.2	0.04	1.08 – 25.01
Alcohol intake at injury and Delayed arrival to hospital (controlled for distance)	5.4	0.058	0.95 – 31.20
Treatment delayed > 3 days after arrival to the hospital and Complications	4.25	0.038	1.08 – 16.70

Overall, 81% of patients with delayed treatment experienced a complication (n=34), compared to the 19% complication rate in those patients without treatment delay (Chi-squared p=0.031). On regression analysis, patients were 4.25 times more likely to have a complication if treatment was delayed more than three days after arrival to the hospital (OR 4.25 (95% CI 1.08-16.70) p=0.038). There was no statistically significant increase in complication rate for patients who arrived to the hospital more than three days after their injury (OR 1.5, 95% CI 0.27-8.09 p=0.64).

Though not statistically significant, patients were 5.8 times more likely to have delayed arrival to the hospital if originating from a rural setting (OR 5.85 95%CI 0.67-50, p=0.10). Similarly, for every 1 km increase in distance from the hospital, patients are 1.03 times more likely to have a delayed arrival. For example, for a patient with 10km distance from the hospital the odds are 10.3x greater that they will have delayed presentation (OR 1.03 95% CI 1.005-1.06, p=0.018).

Patients who reported alcohol intake at time of injury were five times more likely to have delayed presentation to the hospital (OR 5.2, 95% CI 1.08-25.01, p=0.04). After controlling for distance in km this association becomes slightly less significant (OR 5.4, 95% CI 0.95-31.20, p=0.058). However, there was no increased risk of complications in patients who had alcohol exposure (OR 3.78 ,95%CI 0.43-32, p=0.23)

VII.DISCUSSION

Trauma is a leading cause of morbidity and mortality worldwide, though disproportionately impacting low and middle income countries. We prospectively studied 54 patients with craniomaxillofacial trauma , the reasons , factors associated with the delays in management of CMF trauma and associated complications at University Teaching hospital of Kigali (CHUK). We found that CMF injuries occur fairly by sex, with male representing 51(94.4%) and female 3(5.6%) and a male to female ratio of 16.8:1. This is consistent with other reports showing male to female ratio of 5.5:1 [8]. In this study this predominance male may be due to Rwandan culture where males are the ones commonly ride motorcycles, bicycles and car. Almost a half of all CMF trauma occurred in patients aged 15-30 years . Findings in Japan demonstrated similar age group [28]. Young people is an active part of the community and more involved in road traffic accidents. Motorcycle was the most common cause of maxillofacial trauma (33.3%) . In the study done in Nigeria motorcycle related craniomaxillofacial trauma was 67.5% [18] .This is caused by that motorcycles are prevalent in transport of low and middle income countries.

The mandible was the first sub-site to be involved (51, 8%). This is consistent with other reports in the literature[18,29,23,30] and it explained by the anatomical prominence of the mandible in the face . The contributors to delay in care of CMF trauma patients and the resultant outcomes have been explored. The majority of patient (72.2%) presented to the hospital within 24hours post injury . In the report from South Africa found the mean of 10.3 days of presentation to hospital after the injury [11].

The study done in Nigeria reported a delay presentation of 1 month post injury[5]. The delay presentation in Nigerian study was caused by ignorance, transportation issue and economic difficulties [29]. Early presentation in Rwanda, can be explained by its national insurance program (Mutuelle de Sante) whereby 100% of patients who sustained craniomaxillofacial fractures was covered under this program . This likely improved patient's ability to access care earlier and also demonstrate how a nationalized system of insurance can potentially improve health outcomes, minimizing the burden often attributed to lower socioeconomic status and almost of patients transportation to hospital was done by ambulance .

In our setting, alcohol abuse at the time of presentation was found in 10 (18.5%) patients with CMF injury. The study done in Tanzania reported alcohol intake at time of injury in 49.4% [1]. Alcohol abuse can be linked to delay presentation as there was a five times great risk of delayed presentation due to hangover and not taking injury as serious problem.

In our study , 42(77, 9%) patients had delayed treatment whereby 51.9% of them were treated in 4 to 7days post presentation to the hospital and 26% after 7days post-admission . The similar delay has been reported in the literature. The study done in South Africa reported a mean of 10.3 days as the delay to treatment after patients admission to hospital [11]. In our study, unavailability of the maxillofacial surgeons and lack of material for craniomaxillofacial fracture fixation were the main two reasons for delayed treatment. Same findings are reported in the literature in the low and middle income countries whereby shortage of surgical workforce, material (e.g plates and crews) unavailability often impacts surgical decision-making [31,32].

While ORIF is the gold standard treatment for many mandibular fractures and other maxillofacial trauma , closed reduction (MMF in mandibular fracture) was performed in 27.8% in nearly equal number of patients treated by ORIF 24.1% and 31.5% treated conservatively . This is similar to the study done in India in 2015 and found the same result with 31.1% treated conservatively , 27% by closed reduction and 34% by ORIF [30]. This was caused that in LMIC there are not enough maxillofacial surgeon to treat maxillofacial fracture by ORIF as gold standard.

Our study, patients were 4.25 times more likely to have a complication if treatment was delayed more than three days after arrival to the hospital. Reports from Lexington found that delayed treatment of 6 days lead to the complication rate of 13.6% [33] and report in Nigeria showed the complication rate of 35.5% on patients who delayed treatment [24]. This shows how delayed treatment of CMF injuries put patients at risk for complications.

VIII. STUDY LIMITATIONS
No limitation encounted in our study.

IX.CONCLUSION AND RECOMMANDATION

IX.1. CONCLUSION
This study aimed at evaluating the delays and reasons for delays in management craniomaxillofacial trauma

The following are the conclusions:

- The delay in management of Craniomaxillofacial trauma injuries is common in our setting and affect more young people.
- Common cause of CMF trauma is motorcycle accident and the mandible is the most affected site.
- There is significant delayed treatment due to material unavailability and surgeon unavailability and this is associated with occurrence of complications.

IX.2.Recommandations:

The following recommendation should be put into consideration:

To the Ministry of Health and CHUK administration

- To avail materials used to repair craniomaxillofacial trauma.
- To reinforce maxillofacial surgical work force by recruiting maxillofacial surgeon.
- To work together with the Ministry of Education to train maxillofacial surgeons in order to address the crucial shortage of t his workforce.
- To make awareness to health care professionals about care of craniomaxillofacial trauma and encourage motorcyclist and their passengers to wear helmet protecting mandible.

To Dental and Maxillofacial services

- To do all possible to give maxillofacial care in less than 3 days.
- To avail staff in the weekend time to give care to maxillofacial fracture patient on time.

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APPENDICES

DATA COLLECTIONSHEET ON RESEARCH TOPIC**:**

DELAY IN CRANIOMAXILLOFACIAL TRAUMA CARE AT CHUK

Patient Code: **tel:**   **date RDV:**

I. Socio-demographic data

1. Age group:

- ☐ <15
- ☐ 15-30
- ☐ 31-45
- ☐ 46-60
- ☐ >60

2. Gender

- ☐ Male
- ☐ Female

3. Origin

- ☐ City
- ☐ Rural
- ☐ District…………………………..

4. Socio-economic category…………………….

5. Insurance

- ☐ YES
- ☐ NO

II. Pre-admission Data

6. Cause of trauma/injury

- ☐ Motorcycle /bicycle
- ☐ vehicle
- ☐ Fall
- ☐ Assault
- ☐ Other……………………………

7. Alcohol influence:

- ☐ Yes
- ☐ No

☐ Unknown

8. Place of Origin to CHUK

☐ Health center

☐ District hospital

☐ Private clinic/polyclinic

☐ Immediately from accident site

☐ Home

☐ Others

9. Mode of transport to CHUK

☐ Ambulance

☐ Police,

☐ self-transport,

☐ Others

10. Time between the injury and arrival to CHUK (days)

☐ <1days

☐ 1-3 days

☐ 4-7 days

☐ >7days

11. Reason of delay to arrive to CHUK

☐ Delayed diagnosis

☐ Delayed Referral,

☐ Transport issues

☐ Economic difficulties

☐ Personal decision

☐ Others

12. Final Diagnosis

☐ Soft tissue injury

☐ Mandibular fracture

☐ LeFort (1, 2, 3)

☐ Zygomatic fracture

☐ Nasal bone fracture (Nasal bones, NOE)

☐ Orbital fracture

☐ Frontal bone fracture

☐ Other

13. Time between arrival to CHUK and treatment

- ☐ <1days
- ☐ 1-3 days
- ☐ 4-7 days
- ☐ >7days

14. Reasons of delayed treatment

- ☐ Delayed radiologic diagnosis
- ☐ Management Associated injury
- ☐ AdmissionICU
- ☐ Associated injuries
- ☐ Surgeon unavailability
- ☐ Material unavailability
- ☐ Economic difficulties
- ☐ Theater space unavailability
- ☐ Others

15. Type of associated injuries

- ☐ Traumatic Brain Injuries
- ☐ Chest trauma
- ☐ Abdominal trauma
- ☐ Pelvic fracture
- ☐ Limbs fracture
- ☐ none

16. Type of treatment

- ☐ Closed reduction
- ☐ Open reduction and internal fixation
- ☐ Tissues repair
- ☐ Conservative

17. Disposition after treatment

- ☐ Admit in the ward
- ☐ ICU
- ☐ Death
- ☐ Discharge
- ☐ others

18. Short term outcome

- ☐ Healed
- ☐ Dead

☐ Complication

19. Types of complication

 ☐ infection

 ☐ non union

 ☐ delayed union

 ☐ trismus

 ☐ facial deformities

 ☐ facial palsy and

 ☐ transient diplopia

 ☐ chronic pain

 ☐ malunion

 ☐ maloclusion

CONSENTFORM

I…………………………………………………confirm that the purpose of this study
and my role have been well explained to me

by…………………………….....................................I agree to the conditions explained and give consent that Mr./Mrs./Miss………………………………………………………. Can be included in the study.

Names of the participant/attendant……………………………………………………Signature… ………………………………… Date……/……./…..……….

Name of the Witness………………………………………………………….....Signature…………… …………….………………Date……/……/………...

Researcher'snames………………………………………………………………………Researcher 's signature……………………………………Date…../……. /……..

IBISOBANURO NO KWEMERA UBUSHAKASHATSI (Kinyarwanda version)

Umutwe w'ubushakashatsi

Delay in craniomaxillofacial trauma care at CHUK

Ibisobanuro

Njyewe **NIYIGABA GILBERT**, ukora ubu bushakashatsi, ndi umuganga wiga muri Kaminuza y'u Rwanda ishami ry'Ubuvuzi, aho niga ibijyanye no kuvura indwara z' Amatwi, Amazuru, Umuhogo, umutwe n'ijosi.

Muri ubu bushakashatsi, ndimo gukurikirana abarwayi bagize ibikomere byo mu isura barwariye muri CHUK , tukazareba ko abo barwayi badatinda kuvurwa , impamvu yateye gutinda kuvurwa hanyuma turebe niba abatinze kuvurwa hari ingaruka byabagizeho bitewe no gutinda kuvurwa . Buri murwayi mubazaba bujuje ibisabwa azakurikiranwa mugihe azaba akivurwa kugirango tumenye uko ibikomere byo mu isura byakize n'ingaruka byateye.

Mbere ko umurwayi ashyirwa muri ubu bushakashatsi, we ubwe cyangwa umuhagarariye (igihe umurwayi arembye) asobanurirwa ibijyanye n'ububushakashatsi. Hanyuma , agasinya ko yemeye ko umurwayi we ajya mu bushakashatsi.

Mu kujya muri ubu bushakashatsi ntakiguzi cyangwa inyungu yihariye umuntu ku giti cye akuramo ; ariko ibizavamo bishobora kugirira akamaro uwabugiyemo ndetse bishobora kuzagirira akamaro abandi mu gihe kizaza.

Hakoreshwa inomero mu mwanya w'amazina y'umurwayi ; kandi amakuru yose avuye kumurwayi akabikanwa ibanga.

Ibizava muri ubu bushakashatsi ntibizakoreshwa kuzindi nyungu zitari iz'ubushakashatsi kandi mu kubitangaza ntanahamwe hazagaragazwa amazina y'ababukoreweho.

Inyigo y'ububushakashatsi yasuzumwe inemezwa na Komisiyo y'ubushakashatsi muri Kaminuza y'u Rwanda (Research commission: Chair**person of the CMHS/IRB: 0788490522).**

Ku bibazo cyangwa ibindi bisobanuro, baza **Gilbert NIYIGABA**
 Tel: 0783614136 E-mail: gilbertniyigaba430@gmail.com

Kwemera kwinjira mu bushakashatsi kubushake

Njyewe ………………………………………………………………, (imyaka…………)
Nemeye ko nahawe ibisobanuro birambuye na
Dr……………………………………….kuri ubu bushakashatsi mpabwa n'umwanya wo
gusobanuza. Mu gusinya , nemeye kubushake bwanjye ntagahato ko ububushakashatsi
bunkorerwaho/bukorerwa kuri…..…………………….......................................
(Imyaka…………) mpagarariye. (Isano…………………………………………………..)

Umukono……………………………………….………itariki……/…………./…………….
Isano…………………………………………………………………………………………..
Umukono w''ukoraubushakashatsi/Umuhagarariye…………………itariki……/…………./…….

Amazina y'umutangabuhamya………………………………………………………………….
Umukono……………………………… itariki……/…………./…………………………...