ORIGINAL ARTICLE

Impact of COVID-19 on Maxillofacial Trauma Incidence at Vajira Hospital: A Retrospective Study (2018-2021)

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Background: Maxillofacial injuries vary globally depending on social, cultural, and environmental factors. The coronavirus disease 2019 (COVID-19) pandemic has further contributed to global variations in maxillofacial injury incidence owing to precautionary restrictions.

Objective: To investigate the impact of COVID-19 on maxillofacial fractures.

Materials and Methods: The present study was a retrospective cohort study that analyzed the medical records of patients with maxillofacial fractures admitted to the Emergency Department, Vajira Hospital, Bangkok. The incidence, causes, and anatomical sites of fractures were compared between the pre-COVID-19, 2018 to 2019, and COVID-19 periods, in 2020 to 2021.

Results: The present study included 749 patients with maxillofacial fractures. The analysis revealed a 15% decrease in the number of patients with maxillofacial fractures during the COVID-19 pandemic. Males were more affected than females in both periods. Traffic accidents remained the primary cause of injuries, while assault-related injuries decreased significantly. Nasal bone fractures were the most frequent, with a significant reduction in orbital fractures caused by assault (p=0.033) during the COVID-19 period. The incidence of isolated zygomatic arch and panfacial fractures caused by assault increased during the COVID-19 period (p=0.026 and 0.041, respectively). The incidence of mandibular fractures due to other causes was significantly higher (p=0.009).

Conclusion: The COVID-19 pandemic had led to significant changes in daily life in Thailand. Understanding the characteristics of patients with maxillofacial trauma provides valuable insights into prevention and management strategies, particularly during prolonged infectious disease outbreaks such as COVID-19 and potential future incidents.

Keywords: COVID-19; Maxillofacial injuries; Facial injuries; Incidence

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Maxillofacial injuries are a global health problem influenced by social, cultural, and environmental factors, leading to variations among diverse populations[1]. In 2017, the incidence of facial bone and jaw injuries worldwide was 98 per 100,000 population[2]. Notably, the average cost of treating patients with facial trauma has been estimated to be $1,261.96 or 39,750 Baht per patient[3].

Studies on maxillofacial fractures have analyzed the incidence, causes, and types. A retrospective analysis of patients with maxillofacial fractures admitted to King Chulalongkorn Memorial Hospital, Thailand, between 2005 and 2015 showed an annual average of 127 cases. Motorcycle accidents were the most common causes at 39.7%, followed by body assault at 26.5%, falls from height at 12.5%, and car accidents at 7.1%[4]. Another retrospective analysis of 422 patients admitted to King Abdulaziz Medical City, Saudi Arabia, between January 2018 and December 2021, showed that motor vehicle accidents were the primary cause of injury, followed by pedestrian trauma. Orbital and maxillary fractures were the most common, with the mandibular body being the most common region of the mandible to be fractured. Notably, the incidence of maxillofacial fractures is higher in males than in females[5].

On March 11, 2020, the World Health Organization declared coronavirus disease 2019 (COVID-19), an infectious disease caused by severe acute respiratory coronavirus 2, a pandemic. The virus spreads through respiratory droplets and aerosols[6].

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With the spread of COVID-19 and the implementation of lockdown policies, the incidence of maxillofacial trauma had decreased. A previous study conducted in France compared the incidence of maxillofacial fractures during the first month of lockdown with that during the same period in 2018 and 2019[7]. That study revealed a decrease in maxillofacial fractures during the lockdown period, with most injuries attributed to fighting or physical assault. Similarly, another study conducted in Italy compared a 2-month lockdown period in 2020 with the previous three years, between 2017 and 2019[8], showing a higher prevalence of older patients and greater severity of facial injuries during the lockdown.

To the authors' knowledge, no studies had investigated maxillofacial injuries in Thailand during the COVID-19 pandemic. Therefore, the present study aimed to analyze the impact of the pandemic on the changes in the incidence, etiology, and anatomical sites of maxillofacial fractures compared with the pre-COVID-19 period at Vajira Hospital, a tertiary trauma center. This hospital played a significant role in managing the extensive COVID-19 outbreak in Bangkok since the first confirmed case in Thailand on January 13, 2020[9].

Materials and Methods

The present study was a retrospective cohort study that analyzed the electronic patient records of individuals who visited the Emergency Department at Vajira Hospital in Bangkok, Thailand, between January 1, 2018 and December 31, 2019, and between January 1, 2020 and December 31, 2021. It was approved by the Research Ethics Committee of the Faculty of Medicine, Vajira Hospital, Navamindradhiraj University, Thailand (No. 188/2565), and conducted in accordance with the Helsinki Declaration of Human Rights. The present trial was registered with the Thai Clinical Trials Registry, (TCTR20230613002).

The inclusion criteria were 1) sought evaluation at the Emergency Department during the specified period, 2) diagnosed with maxillofacial fractures coded as S02.0-S02.9 according to the International Classification of Diseases, 10th Edition (ICD-10), and 3) confirmed maxillofacial fractures through imaging. Panfacial fractures were defined as having more than two out of three broken facial bones when dividing the facial bones into the upper, middle, and lower thirds. The exclusion criteria were 1) undocumented or unclear facial fractures, 2) fractures of the vault and base of the skull (ICD-10 codes S020–S021), and 3) without imaging data to confirm the fractures or those documented as having fractures but without actual fractures.

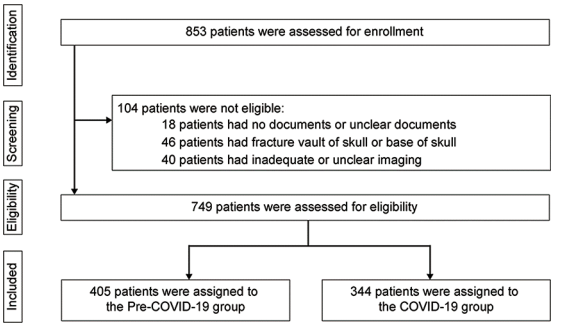

Figure 1. Flow diagram of study selection.

The patients were categorized into two groups, the COVID-19 group as the experimental group, which included those who visited the Emergency Department during the COVID-19 period between 2020 and 2021, and the pre-COVID-19 group, as the control group, which included those who visited the department before the COVID-19 period between 2018 and 2019 (Figure 1). Data on age, gender, injury site, and cause of injury were collected.

The etiology of the injuries was classified into eight main categories as traffic accidents, pedestrian strikes, assaults, falls from height, sports-related accidents, work-related accidents, falls that are non-height-related, and other causes. The traffic accident category included accidents involving cars, motorcycles, and bicycles. Assaults referred to trauma resulting from human violence. Falls from height included falls exceeding two meters to the ground. Sports-related accidents included trauma during physical activities. The work-related accidents category included trauma during work-related activities. Falls from non-height-related referred to trauma resulting from self-injury caused by stumbling. The "other causes" category included unintentional accidents that did not belong to the preceding eight categories such as heavy objects falling on a patient.

Statistical analyses

The prevalence rates were calculated and presented as percentages. Continuous variables were presented as mean ± standard deviation, and categorical variables were presented as numbers (percentages). Between-group comparisons were performed using independent t-tests or Mann-Whitney U tests, as appropriated. Proportions were

Table 1. Patients' baseline characteristics (n=749)

Characteristics	Total (n=749); n (%)	Pre-COVID-19 (2018-2019) (n=405); n (%)	COVID-19 (2020-2021) (n=344); n (%)	p-value
Sex				0.854
Male	555 (74.10)	299 (73.83)	256 (74.42)	
Female	194 (25.90)	106 (26.17)	88 (25.58)	
Age (years)				0.444
0 to 10	18 (2.40)	11 (2.72)	7 (2.03)	
11 to 20	140 (18.69)	84 (20.74)	56 (16.28)	
21 to 30	172 (22.96)	87 (21.48)	85 (24.71)	
31 to 40	115 (15.35)	67 (16.54)	48 (13.95)	
41 to 50	101 (13.48)	58 (14.32)	43 (12.50)	
51 to 60	78 (10.41)	34 (8.40)	44 (12.79)	
61 to 70	54 (7.21)	26 (6.42)	28 (8.14)	
71 to 80	39 (5.21)	20 (4.94)	19 (5.52)	
81 to 90	28 (3.74)	16 (3.95)	12 (3.49)	
91 to 100	4 (0.53)	2 (0.49)	2 (0.58)	
Mean±SD	38.92±20.37	37.97±20.26	40.03±20.47	0.127
Cause of injury				
Traffic accidents	330 (44.06)	179 (44.20)	151 (43.90)	0.934
Pedestrian strikes	25 (3.34)	10 (2.47)	15 (4.36)	0.151
Body assaults	193 (25.77)	117 (28.89)	76 (22.09)	0.034*
Falls from height	36 (4.81)	16 (3.95)	20 (5.81)	0.235
Sports-related accidents	12 (1.60)	5 (1.23)	7 (2.03)	0.385
Work-related accidents	14 (1.87)	7 (1.73)	7 (2.03)	0.757
Falls	116 (15.49)	59 (14.57)	57 (16.57)	0.450
Other causes	23 (3.07)	12 (2.96)	11 (3.20)	0.853

SD=standard deviation

compared using chi-square or Fisher's exact tests. Statistical analyses were performed using IBM SPSS Statistics, version 28.0 (IBM Corp., Armonk, NY, USA). All reported p-values were two-sided, and a significance level of p-value less than 0.05 was considered statistically significant.

Results

Demographics of patients with maxillofacial fractures

Seven hundred forty-nine patients with maxillofacial fractures resulting from trauma treated at the Emergency Department of Vajira Hospital were included in the present study. Among these, 405 were in the pre-COVID-19 group, thus between 2018 and 2019 and 344 were in the COVID-19 group, thus, between 2020 and 2021, indicating a 15% decrease in the total number of patients during the COVID-19 period (Table 1).

In the pre-COVID-19 group, 73.83% were male and 26.17% were female, while in the COVID-19 group, 74.42% were male and 25.58% were female. This finding revealed no significant difference in gender distribution between the two groups (p=0.854). The mean age of patients was 37.97 years in the pre-COVID-19 period and 40.03 years in the COVID-19 period, indicating no significant difference (p=0.127). When classifying the groups into age ranges as 0 to 10, 11 to 20, 21 to 30, 31 to 40, 41 to 50, 51 to 60, 61 to 70, 71 to 80, 81 to 90, and older than 90 years, no significant differences were observed among all age groups (p=0.444) (Table 1).

Etiology of maxillofacial fractures

During the COVID-19 period, a decrease in the number of patients was observed in categories such as traffic accidents, body assaults, and falls, however, no decrease was observed in other categories. No significant difference was observed in the proportion of patients in categories such as traffic accidents, pedestrian strikes, falls from heights, sports-related accidents, work-related accidents, falls, or other causes (p>0.05). Nevertheless, a significant decrease was noted in the proportion of patients in the body assault category (p=0.034) (Table 1). The comparison of the percentage of patients with fractures and

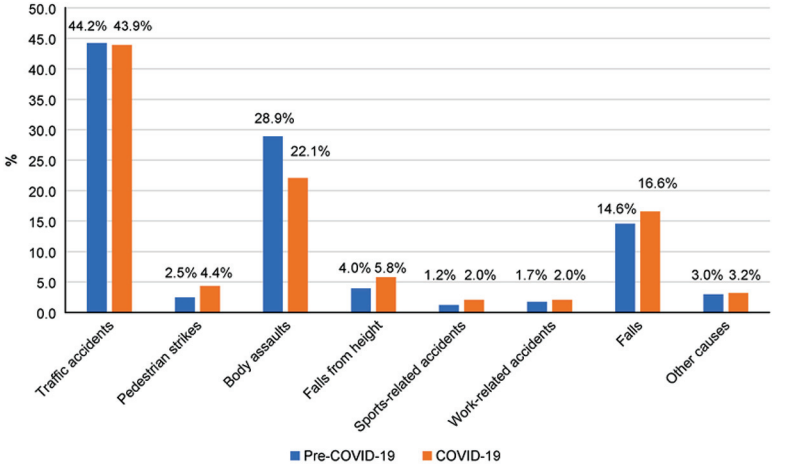

Figure 2. Comparison of injury causes between the pre-COVID-19 and COVID-19 periods.

Table 2. Anatomical sites of fractures (n=818 sites)

	Total (n=818); n (%)	Pre-COVID-19 (2018-2019) (n=448); n (%)	COVID-19 (2020-2021) (n=370); n (%)	p-value
Frontal bone	22 (2.69)	15 (3.35)	7 (1.89)	0.200
Orbital bone	143 (17.48)	77 (17.19)	66 (17.84)	0.807
Nasal bone	232 (28.36)	138 (30.80)	94 (25.41)	0.088
Zygomatic bone	138 (16.87)	73 (16.29)	65 (17.57)	0.628
Zygomatic arch	28 (3.42)	15 (3.35)	13 (3.51)	0.897
Maxillary bone	69 (8.44)	39 (8.71)	30 (8.11)	0.759
Mandible	115 (14.06)	63 (14.06)	52 (14.05)	0.997
NOE complex	5 (0.61)	3 (0.67)	2 (0.54)	0.814
Panfacial	51 (6.23)	21 (4.69)	30 (8.11)	0.044*
Le Fort 1	5 (0.61)	1 (0.22)	4 (1.08)	0.182
Le Fort 2	6 (0.73)	1 (0.22)	5 (1.35)	0.097
Le Fort 3	4 (0.49)	2 (0.45)	2 (0.54)	1.000

NOE=naso-orbitoethmoid

their etiologies between the pre-COVID-19 and COVID-19 periods was remarkable (Figure 2).

Anatomy of maxillofacial fracture sites

Eight hundred eighteen fracture sites were identified and included 448 in the pre-COVID-19 group and 370 in the COVID-19 group. During the COVID-19 period, fractures occurred at various anatomical sites, including the frontal bone, orbital bone, naso-orbitoethmoid (NOE) bone, nasal bone, zygomatic bone, zygomatic arch, maxillary bone, and mandible. No significant difference was observed in the proportion of patients with fractures at these sites ($p>0.05$). Furthermore, no decrease was observed in the number of patients with panfacial, or Le Fort 1, 2, and 3 fractures. No significant difference was observed in the proportion of patients with Le Fort 1, 2, or 3 fractures ($p>0.05$). Nevertheless, a significant increase was observed in the proportion of patients with facial fractures ($p=0.044$) (Table 2). The comparison of the percentages of fracture sites between the pre-COVID-19 and COVID-19 periods was remarkable (Figure 3).

Correlation between maxillofacial fracture sites and etiology

Data from the pre-COVID-19 and COVID-19 periods were combined to analyze maxillofacial fracture patterns based on etiology (Table 3). Among patients with fractures caused by traffic accidents, the zygomatic bone was the most common site, followed by the mandible. In patients with fractures from body assaults, the nasal bone was the most frequent site, followed by the orbital bone.

No significant association was observed between the fracture site and the etiology of fractures involving

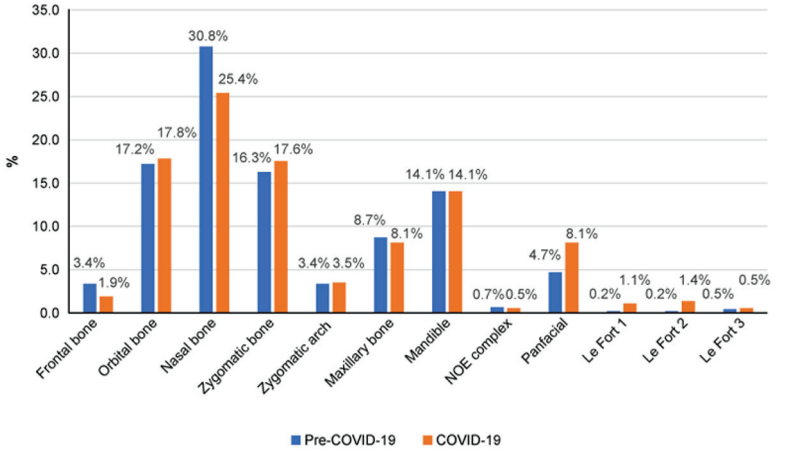

Figure 3. Comparison of fracture sites between the pre-COVID-19 and COVID-19 periods.

Table 3. Causes and maxillofacial fracture sites

	Traffic accident; n (%)		p-value	Pedestrian strikes; n (%)		p-value	Body assaults; n (%)		p-value	Sports-related accident; n (%)		p-value
	Pre-COVID-19 (n=205)	COVID-19 (n=164)		Pre-COVID-19 (n=10)	COVID-19 (n=18)		Pre-COVID-19 (n=122)	COVID-19 (n=83)		Pre-COVID-19 (n=6)	COVID-19 (n=7)	
Frontal bone	7 (3.4)	4 (2.4)	0.584	0 (0.0)	1 (5.6)	1.000	0 (0.0)	1 (1.2)	0.405			
Orbital bone	26 (12.7)	28 (17.1)	0.236	2 (20.0)	2 (11.1)	0.601	33 (27.0)	12 (14.5)	0.033*	0 (0.0)	1 (14.3)	1.000
Nasal bone	35 (17.1)	20 (12.2)	0.191	1 (10.0)	3 (16.7)	1.000	59 (48.4)	40 (48.2)	0.981	5 (83.3)	4 (57.1)	0.559
Zygomatic bone	43 (21.0)	38 (23.2)	0.613	3 (30.0)	4 (22.2)	0.674	13 (10.7)	6 (7.2)	0.406	1 (16.7)	0 (0.0)	0.462
Zygomatic arch	12 (5.9)	6 (3.7)	0.331	1 (10.0)	0 (0.0)	0.357	0 (0.0)	4 (4.8)	0.026*			
Maxillary bone	26 (12.7)	15 (9.1)	0.283	2 (20.0)	4 (22.2)	1.000	6 (4.9)	5 (6.0)	0.730			
Mandible	33 (16.1)	21 (12.8)	0.374	1 (10.0)	2 (11.1)	1.000	10 (8.2)	10 (12.0)	0.362	0 (0.0)	1 (14.3)	1.000
NOE complex	3 (1.5)	2 (1.2)	1.000									
Panfacial	16 (7.8)	21 (12.8)	0.112	0 (0.0)	2 (11.1)	0.524	1 (0.8)	5 (6.0)	0.041*	0 (0.0)	1 (14.3)	1.000
Le Fort 1	1 (0.5)	4 (2.4)	0.176									
Le Fort 2	1 (0.5)	5 (3.0)	0.092									
Le Fort 3	2 (1.0)	0 (0.0)	0.505									

(continued)	Work-related accident; n (%)		p-value	Falls ; n (%)		p-value	Falls from height		p-value	Other causes		p-value
	Pre-COVID-19 (n=7)	COVID-19 (n=7)		Pre-COVID-19 (n=65)	COVID-19 (n=57)		Pre-COVID-19 (n=21)	COVID-19 (n=23)		Pre-COVID-19 (n=12)	COVID-19 (n=11)	
Frontal bone				6 (9.2)	1 (1.8)	0.120				2 (16.7)	0 (0.0)	0.478
Orbital bone	0 (0.0)	1 (14.3)	1.000	12 (18.5)	17 (29.8)	0.141	4 (19.0)	4 (17.4)	1.000	0 (0.0)	1 (9.1)	0.478
Nasal bone	3 (42.9)	2 (28.6)	1.000	25 (38.5)	18 (31.6)	0.427	4 (19.0)	4 (17.4)	1.000	6 (50.0)	3 (27.3)	0.400
Zygomatic bone	1 (14.3)	2 (28.6)	1.000	5 (7.7)	8 (14.0)	0.257	5 (23.8)	7 (30.4)	0.622	2 (16.7)	0 (0.0)	0.478
Zygomatic arch	0 (0.0)	1 (14.3)	1.000	0 (0.0)	1 (1.8)	0.467	2 (9.5)	1 (4.3)	0.599			
Maxillary bone				2 (3.1)	6 (10.5)	0.144	2 (9.5)	0 (0.0)	0.222	1 (8.3)	0 (0.0)	1.000
Mandible	3 (42.9)	1 (14.3)	0.559	12 (18.5)	6 (10.5)	0.218	3 (14.3)	4 (17.4)	1.000	1 (8.3)	7 (63.6)	0.009*
NOE complex												
Panfacial				3 (4.6)	0 (0.0)	0.247	1 (4.8)	1 (4.3)	1.000			
Le Fort 1												
Le Fort 2												
Le Fort 3							0 (0.0)	2 (8.7)	0.489			

NOE=naso-orbitoethmoid

the frontal bone, nasal bone, NOE bone, zygomatic bone, maxillary bone, or Le Fort 1, 2, and 3 fractures (p>0.05). However, a significant decreased in the proportion of orbital bone fractures caused by body assault was observed during the COVID-19 pandemic (p=0.033). In contrast, a significant increase in the proportion of isolated zygomatic arch and panfacial fractures caused by body assault was observed during the COVID-19 period (p=0.026 and 0.041, respectively). In addition, a significant increase in

the proportion of mandibular fractures caused by other types of traumas was observed during this period (p=0.009).

Discussion

In Thailand, strict measures have been implemented to prevent the spread of COVID-19. Initially intended for a limited period, these measures had to be extended by 2021. Trauma is linked to human behavior, and restrictions such as social distancing significantly impact public behavior, altering the pattern of trauma.

During the COVID-19 pandemic, the number of patients with maxillofacial fractures caused by trauma had been affected, and changed in trauma etiology have been observed. In the present study, no significant differences in gender, mean age, or the number of patients across different age groups were observed between the pre-COVID-19 and COVID-19 periods. However, males exhibited a higher incidence of maxillofacial fractures than females[4,5,7]. This finding contrasts with a study conducted in Italy, which found that patients with maxillofacial fractures during the lockdown period were older than those before the pandemic[8].

Isolation and financial stressors during the COVID-19 pandemic might have influenced home situations, increasing tensions and potentially leading to a higher incidence of violence[10]. Ludwig et al.[11] and Vishal et al.[12] reported a notable rise in facial trauma cases associated with assaults, while Marchant et al. showed no increase in interpersonal or domestic violence during the lockdown[13]. In the present study, a significant decrease in the incidence of fractures caused by body assaults was observed. This decrease can be attributed to the reduction in outdoor activities due to social distancing measures and other restrictive measures, such as banning gatherings of more than five people during the COVID-19 pandemic[14,15].

During the COVID-19 period, a higher proportion of certain causes of maxillofacial trauma, such as pedestrian strikes, falls from height, sports-related accidents, work-related accidents, falls, and other causes, were compared to the pre-COVID-19 period. However, no significant differences were observed between the groups, and these trends can be attributed to several factors. First, reduced road congestion during the pandemic has resulted in higher vehicle speeds, leading to decreased pedestrian awareness while crossing streets. Second, with people staying at home, high places and stairs were used more frequently, leading to more falls. Third, the shift to remote work had allowed people more free time, potentially leading to increased physical activity and participation in sports, resulting in more sports-related injuries. Fourth, the increased use of home spaces increased the risk of falls and accidents, which had been amplified during the COVID-19 outbreak.

In the present study, no significant decrease in traffic accidents was observed during the COVID-19 period compared to the pre-COVID-19 period. However, a decrease in the incidence of car accidents was observed. This phenomenon may have been due to a decrease in long-distance travel and movement[16].

A significant increase in fractures at specific anatomical sites, particularly isolated zygomatic arch and panfacial fractures resulting from physical assault, was observed during the COVID-19 period. Conversely, a significant decrease in the incidence of orbital fractures has been observed. This increase in the number of fractures may be attributed to several factors. Studies have revealed that interpersonal and intimate partner violence increased during the pandemic, potentially because of changes in alcohol consumption habits[17] and isolation and financial stressors during the COVID-19 pandemic[10]. Prolonged periods of staying home created an environment conducive to these issues[18]. Therefore, the observed increase in fractures, particularly those caused by physical assaults, might be related to the overall rise in interpersonal and intimate partner violence during the COVID-19 pandemic. The decrease in orbital fractures could be influenced by factors such as changes in daily activities, reduced social interactions, and altered trauma patterns.

The present study showed a trend toward more severe fractures, including Le Fort 1 and 2, and panfacial fractures, during the COVID-19 pandemic. Conversely, other fracture sites, such as the frontal, orbital, nasal, NOE, maxillary, and mandibular bones, showed a decreasing trend. However, no statistically significant differences were observed in these trends between the COVID-19 and pre-COVID-19 periods.

In the Asian population, the malar bone and zygomaticomaxillary complex are in the most prominent anatomical position[19-21], which is usually the most common fracture site among Thai people[4]. In the present study, nasal fractures had the highest incidence, with physical assaults being the most common cause. However, an analysis of the causes and sites of maxillofacial fractures revealed a significant decrease in orbital bone injuries caused by assaults during the COVID-19 period. In contrast, a significant increase in isolated zygomatic arch and

panfacial fractures caused by assaults was observed. Fracture patterns can vary based on the direction and force of the injury.

The present study showed a significant increase in mandibular fractures from other causes during the COVID-19 period, which could be attributed to several factors, including marine accidents in four cases, falling out of bed in one case, falling out of a patient's wheelchair in one case, and a heavy object falling on a patient in one case. By contrast, only one case of falling out of bed was reported during the pre-COVID-19 period. These findings are consistent with the broader context of the pandemic, where lockdowns and restrictions led to an increase in domestic accidents as more people spent time at home. The rise in both indoor and outdoor injuries, combined with behavioral changes such as increased stress and transportation-related activities, such as taking a ferry, contributed to the higher incidence of mandibular fractures during this time. However, the small number of analyzed cases may not fully represent the true prevalence, but the shift in trauma patterns remains notable.

The present study uniquely examined the impact of the COVID-19 pandemic on maxillofacial trauma incidence in Thailand, offering a novel geographic and cultural perspective. The present research is the first of its kind in Thailand, revealing significant shifts in trauma patterns, such as a decrease in assault-related orbital fractures and an increase in isolated zygomatic arch and panfacial fractures during the pandemic. These findings provide valuable insights for public health strategies, highlighting the need for adaptive trauma management and prevention protocols during pandemics. Additionally, the present study significantly contributes to the existing literature by providing new insights into the etiology and anatomical distribution of maxillofacial fractures during the COVID-19 pandemic.

While previous studies from France and Italy noted changes in trauma patterns[7,8], the present study offers a unique perspective from Southeast Asia, highlighting different specific trends. The authors observed a significant decrease in assault-related injuries and an increase in fractures related to domestic environments, suggesting a shift in trauma dynamics due to social restrictions. These findings not only advance the understanding of trauma patterns during pandemics but also underscore the importance of region-specific studies. Future research should consider multicenter and longitudinal approaches to further explore these dynamics and inform global trauma management strategies.

The present study had limitations. First, this was a single-center study, and the data collected may not accurately reflect the overall occurrence of the disease at regional or national levels. Second, this study included patients with maxillofacial trauma whose records were available and excluded those who experienced maxillofacial trauma but were not recorded in the database. Third, the present study was conducted during the COVID-19 pandemic, and the government eased restrictive measures in the later stages of 2021. The actual implementation and impact of these changes on the study outcomes are difficult to estimate. Despite these limitations, the strengths of the present study include the detailed analyses of maxillofacial fractures and their etiology during the COVID-19 pandemic. The present study provides valuable insights into changes in fracture patterns and the impact of pandemic-related measures on maxillofacial trauma. These findings contribute to the existing literature and can help healthcare professionals and policymakers manage and prevent maxillofacial injuries in similar situations.

Based on the identified limitations and strengths, future studies on maxillofacial trauma should consider conducting multicenter studies with broader perspectives and comparisons between populations. Additionally, population-based approaches that include data from various sources beyond patient records could provide a more accurate assessment of the impact.

Conclusion

The COVID-19 pandemic has significantly impacted the incidence, cause, and types of maxillofacial fractures. Identifying the characteristics of patients with maxillofacial trauma helps prevent fractures and effectively manage them during prolonged infectious disease outbreaks, such as COVID-19, and potential future incidents.

What is already known on this topic?

Maxillofacial injuries vary globally due to social, cultural, and environmental factors, with traffic accidents and assaults being the common causes. Previous studies have shown the COVID-19 pandemic led to a decrease in maxillofacial trauma incidents in some countries due to lockdowns and reduced social interactions.

What does this study add?

This study reveals the COVID-19 pandemic

resulted in a 15% decrease in maxillofacial fractures at Vajira Hospital, with a significant reduction in assault-related injuries and changes in the types and causes of fractures. It highlights the need for region-specific data to understand the impact of global events on trauma incidence and suggests tailored prevention strategies for future outbreaks.

Authors' contributions

KT collected the data and drafted the manuscript. WL collected the data and made critical revisions. PS drafted the manuscript and made critical revisions. All authors designed the study and analyzed, interpreted, read, and approved the final manuscript.

Conflicts of interest

The authors declare that they have no disclosures.

References

1. Al-Hassani A, Ahmad K, El-Menyar A, Abutaka A, Mekkodathil A, Peralta R, et al. Prevalence and patterns of maxillofacial trauma: a retrospective descriptive study. Eur J Trauma Emerg Surg 2022;48:2513-9.
2. Lalloo R, Lucchesi LR, Bisignano C, Castle CD, Dingels ZV, Fox JT, et al. Epidemiology of facial fractures: incidence, prevalence and years lived with disability estimates from the Global Burden of Disease 2017 study. Inj Prev 2020;26 Supp 1:i27-35.
3. Saperi BS, Ramli R, Ahmed Z, Muhd Nur A, Ibrahim MI, Rashdi MF, et al. Cost analysis of facial injury treatment in two university hospitals in Malaysia: a prospective study. Clinicoecon Outcomes Res 2017;9:107-13.
4. Pungrasmi P, Haetanurak S. Incidence and etiology of maxillofacial trauma: a retrospective analysis of King Chulalongkorn Memorial Hospital in the past decade. Asian Biomed 2018;11:353-8.
5. Asiri A, Algoblan D, Asiri E, Albishi S, Al Salamah M. Trends of maxillofacial and mandibular fractures in level I and II trauma patients in a tertiary hospital in Saudi Arabia. Saudi Dent J 2022;34:772-8.
6. World Health Organization. Coronavirus disease (COVID-19): how is it transmitted? [Internet]. 2021 Dec 23 [cited 2022 Oct 10]. Available from: https://www.who.int/news-room/q-a-detail/coronavirus-disease-covid-19-how-is-it-transmitted.
7. de Boutray M, Kün-Darbois JD, Sigaux N, Lutz JC, Veyssiere A, Sesque A, et al. Impact of the COVID-19 lockdown on the epidemiology of maxillofacial trauma activity: a French multicentre comparative study. Int J Oral Maxillofac Surg 2021;50:750-5.
8. Canzi G, De Ponti E, Corradi F, Bini R, Novelli G, Bozzetti A, et al. Epidemiology of maxillo-facial trauma during COVID-19 lockdown: Reports from the Hub Trauma Center in Milan. Craniomaxillofac Trauma Reconstr 2021;14:277-83.
9. Ratnarathon A. Coronavirus infectious disease-2019 (COVID-19): a case report, the first patient in Thailand and outside China. J Bamrasnaradura Infect Dis Inst 2020;14:116-23.
10. Mazza M, Marano G, Lai C, Janiri L, Sani G. Danger in danger: Interpersonal violence during COVID-19 quarantine. Psychiatry Res 2020;289:113046.
11. Ludwig DC, Nelson JL, Burke AB, Lang MS, Dillon JK. What is the effect of COVID-19-related social distancing on oral and maxillofacial trauma? J Oral Maxillofac Surg 2021;79:1091-7.
12. Vishal, Prakash O, Rohit, Prajapati VK, Shahi AK, Khaitan T. Incidence of maxillofacial trauma amid covid-19: A comparative study. J Maxillofac Oral Surg 2022;21:420-5.
13. Marchant AD, Gray S, Ludwig DC, Dillon J. What is the effect of COVID-19 social distancing on oral and maxillofacial trauma related to domestic violence? J Oral Maxillofac Surg 2021;79:2319.e1-8.
14. Yeo TJ. Sport and exercise during and beyond the COVID-19 pandemic. Eur J Prev Cardiol 2020;27:1239-41.
15. Evans DP. COVID-19 and violence: a research call to action. BMC Womens Health 2020;20:249. doi: 10.1186/s12905-020-01115-1.
16. Pandey A, Saxena NK. Effectiveness of government policies in controlling COVID-19 in India. Int J Health Serv 2022;52:30-7.
17. Kim K. Impacts of COVID-19 on transportation: Summary and synthesis of interdisciplinary research. Transp Res Interdiscip Perspect 2021;9:100305. doi: 10.1016/j.trip.2021.100305.
18. Krishnakumar A, Verma S. Understanding domestic violence in India during COVID-19: a routine activity approach. Asian J Criminol 2021;16:19-35.
19. Mahatumarat C, Rojvachiranonda N. Reduction malarplasty without external incision: a simple technique. Aesthetic Plast Surg 2003;27:167-71.
20. Wen YF, Wong HM, Lin R, Yin G, McGrath C. Inter-ethnic/racial facial variations: A systematic review and bayesian meta-analysis of photogrammetric studies. PLoS One 2015;10:e0134525.
21. Kasem A, Redenski I, Oren D, Zoabi A, Srouji S, Kablan F. Decline in maxillofacial injuries during the pandemic: The hidden face of COVID-19. J Clin Med 2022;12:128. doi: 10.3390/jcm12010128.