

ORIGINAL ARTICLE

The effect of lockdown on the number of trauma cases and the pattern of injury in a trauma Centre in Dubai during the month of lockdown and comparing it to the pre-COVID time

Farnoosh Jalaluddin Farzin^{1*}, Fatima Shire², Zahra Kasim AlDhuhaihat²,
Mariam Isa Jaafar³

ABSTRACT

Background: Due to the coronavirus disease 2019 (COVID-19) pandemic, full-time lockdown was applied in many countries around the world. Published literature shows that the risk of suicide and assaults has increased but the risk of motor vehicle accidents has reduced. In this research, we want to study the impact of lockdown during the COVID-19 pandemic on the trauma cases who presented to the trauma center.

Method: This retrospective cross-sectional study retrieved all the trauma cases that were presented to the Emergency Department in Rashid Hospital during April 2019 and 2020 from the patients' electronic records system. We included all the trauma cases who fell in the Canadian Triage and Acuity Scale of T1–T3 only.

Results: A total of 3,268 trauma cases were studied. The number of cases in April 2019 was double the number of cases in 2020. However, the pattern of injuries was variable in the 2 years. There were higher rates of motor vehicle accidents in non-lockdown months than in the lockdown months (10.5% and 6.5%, respectively) (p -value <0.001). Suicide rates and assault victims rates were higher in the lockdown phase (p -value <0.001).

Conclusion: An injury occurrence was reduced by 39.2% during the COVID-19 pandemic. Even though the overall percentage of trauma severity index was higher before the pandemic, there was no significant difference in Intensive Care Unit admission and mortality.

Keywords: COVID-19, pandemic, road traffic accident, emergency department.

Introduction

The coronavirus disease 2019 (COVID-19) pandemic and lockdowns had a significant impact on society and healthcare, with its impact ranging from affecting the mental health and wellbeing of the population. During COVID-19 emerging epidemics and lockdowns, reports of elevated anxiety, stress, and depression were seen [1]. In addition, there has been more focus on the volume and patterns of cases of trauma during the pandemic. According to studies, the COVID-19 lockdown may have increased the number of trauma cases, which has in turn affected trauma systems globally, possibly as a result of social isolation, financial instability, and greater susceptibility to domestic abuse [2,3]. Future interventions can be made more effective by understanding both the number and pattern of trauma

cases during the COVID-19 lockdown period compared to non-COVID times [4].

Lockdown and staying-at-home are two COVID-19 containment measures that were anticipated to minimize road traffic characteristics and, as a result, reduce road

Correspondence to: Farnoosh Jalaluddin Farzin

*Emergency Medicine Resident, Rashid Hospital, Dubai Academic Health Corporation (DAHC), Dubai, UAE.

Email: farnoosh_123@hotmail.com

Full list of author information is available at the end of the article.

Received: 01 March 2024 | **Accepted:** 13 March 2024



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traffic crashes [5]. According to another research conducted at King Suad Medical City, road traffic injuries were decreased by 42.7% [6]. The significant reduction in vehicle movement during the lockdown was directly related to the reduction in maxillofacial injuries [7]. Abdullah [8] reported a 39.2% decrease in overall injury incidence. Reports from other Emirates in the UAE's police force were used to support this analysis. An 84% drop in Sharjah, Dubai, with a decrease of 46%, and Ajman a 45% decrease in road traffic accidents has been reported [8].

To stop the coronavirus from spreading, Gulf States strengthened security measures in major cities. Dubai instituted a 2-week lockdown, and Saudi Arabia closed off portions of the Red Sea city of Jeddah. While Dubai had a 2-week lockdown, supermarkets, pharmacies, and food and drug delivery services carried on as usual despite the restrictions on movement and legal penalties against violators [9].

The Dubai government proposed new measures easing business restrictions, allowing all retail and wholesale firms, as well as gyms, movie theatres, educational and training institutions, childcare centers, and other businesses to reopen with varied degrees of capacity. After a trying 2 months of lockdown, which included a 3-week period in April when some of the strictest measures ever imposed anywhere in the world required residents to apply for a police permit to leave their homes, the 3.3 million-person emirate, the commercial capital of the UAE, is moving forward with reopening its economy [10].

Despite these major mitigation in trauma cases, evidence showed an increase in the number of trauma cases during the COVID-19 lockdown [2,3]. This study aimed to assess the incidence and prevalence of trauma cases that present to the emergency department during the lockdown and compare it to the pre-COVID-19 era.

Subjects and Methods

A retrospective cross-sectional study was designed. All trauma cases who attended the main trauma Centre in Rashid Hospital, Dubai, United Arab Emirates, Emergency Department from the 1st of April 2020 to the 30th of April 2020 were retrieved, reviewed, and compared to the cooperative period of 1st of April 2019 to 30th of April 2019.

All retrieved trauma cases were classified based on the Canadian Triage and Acuity Scale to T1-T5. This study included all the patients with the triage category of T1-T3 as the hospital was accepting those cases during the lockdown and the T4 and T5 cases were deferred to other hospitals as they were minor cases. This study included patients from both age extremities, from newborns to elderly. We excluded all the cases of animal bites in our study and all patients who fell in the triage category of T4 and T5.

The data were obtained from the electronic record database which is implemented in the hospital (Salama System). The retrieved data were collected on a Microsoft Excel 2021 sheet, with variables of patient's demographic, Triage category, patient's trauma pattern, and mechanism of injury. We also included,

if any, computed topography (CT) polytrauma needed for the patient. The data also included their outcome and disposition from the hospital.

The data was analyzed using Statistical Package for the Social Sciences (SPSS) software 28, IBM Corp. Released 2021. IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp The descriptive statistics were performed and were represented as, along with categorical variables, frequency (*n*) and percentage (%). Continuous variables were reported as mean \pm standard deviation. The normality test was not applied due to the large sample size. The Central Limit Theorem applies in this condition. A confidence interval of 95% was set with a *p*-value of <0.05 considered statistically significant.

Ethical approval was obtained from the Dubai Scientific Research Ethics Committee, Dubai Health Authority. Patient confidentiality was maintained using a unique password used for accessing the patient's data in the data collection sheet.

Results

Data of a total of 16,694 patients who visited the emergency department in April 2019 and 2020, including both media and trauma cases, were retrieved. Of these, 12,594 cases were retrieved from April 2019 while 4,100 cases were retrieved from April 2020. After applying our inclusion and exclusion criteria, these cases were filtered, and 3,268 cases were included in our analyses. Therefore, the number of patients in April 2019 was 2,263 patients, and the total number of patients in April 2020 was 1,006.

The majority of the patients were young adult patients with a mean age was 28 ± 16 years. The full range of the age was between newborns till geriatrics age of 94 years old. The data analysis showed a total of 2,499 male patients and 767 female patients (76.4% and 23.5%, respectively). Two patients were missed from the system and were classified as unknown in the hospital system (Table 1).

Table 1. Socio-demographic characteristics of patients.

| Variables | Frequencies (n) | Frequencies (%) |
|------------------------------------|-----------------|-----------------|
| Gender | | |
| Male | 2,499 | 76.4 |
| Female | 767 | 23.5 |
| Nationalities (per WHO regions) | | |
| African regions | 89 | 2.7 |
| Region of Americas | 21 | 0.6 |
| Southeast Asian region | 1,042 | 31.9 |
| European region | 110 | 3.4 |
| Eastern Mediterranean region | 1,794 | 54.9 |
| Western Pacific region | 154 | 4.7 |
| UAE nationals versus non nationals | | |
| UAE nationals | 504 | 15.4 |
| Non-UAE nationals | 2,765 | 84.6 |

The nationalities were classified into regions based on WHO regions classification. The highest number of nationalities were from the Eastern Mediterranean region ($n = 1,794$, 54.9%) (Figure 1).

A total of 59 cases' nationalities were missing as the patients were classified as unknown in the system which we retrieved the data from. Patients were further classified into UAE nationals and non-UAE nationals. The non-UAE nationals were the majority of the cases ($n = 2,765$, 84.6%). The missing number of the nationalities were classified under non-UAE nationals as they did not have Emirates ID upon registering in the hospital, Figure 2.

Further analysis was done in relation to the detailed nationalities. There were a total of 83 nationalities in both April 2019 and 2020. The top eight nationalities are mentioned in the table below in order from the highest to lowest, Table 2.

The demographics data were compared from 2019 to 2020, there was no significant change in gender (p -value

0.189). In both years, males were the majority of the population as shown in Figure 3.

For further analysis of the age, we subcategorized them into three different age groups to compare them. There is a significant difference in the total number of patients who presented in April 2019 and 2020 (Figure 4) (p -value < 0.001).

Table 3 elaborates more on the different types of mechanisms of injury, trauma pattern, and trauma intension that were presented to the emergency medicine department (ED) in the 2 months. The mechanism of injury is subcategorized into motor vehicle accident, motorbike accident, fall, stab wounds, pedestrian accident, and others (occupational injuries with cutting machines, accidental injuries while cooking, assault cases that are not stab wounds, blunt injuries to the body accidentally, or burns). There was one missing case as it was not mentioned in the patient record what was the mechanism of injury. Also, we divided them according to the trauma intension which were accidental, assault, and suicidal.

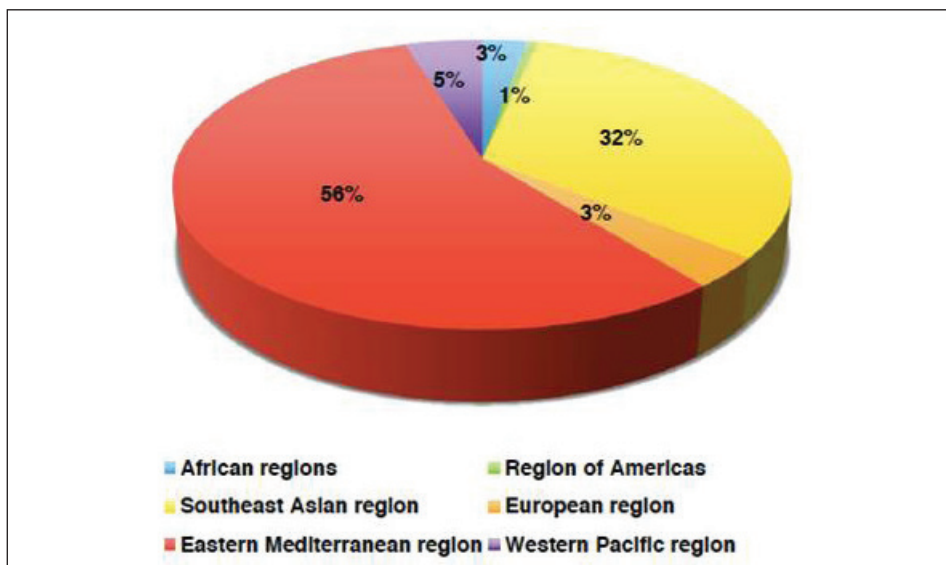


Figure 1. Distribution of patients based on WHO regions.

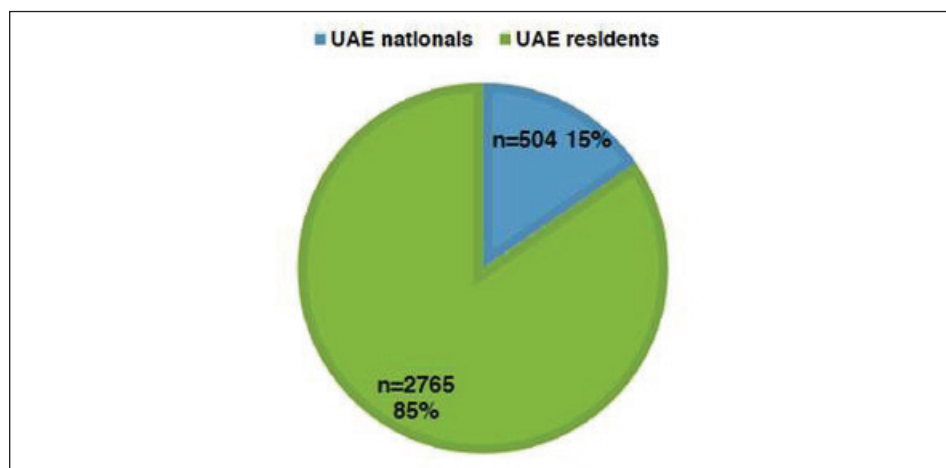


Figure 2. Distribution of local and resident patients.

Table 2. Highest nationalities in the trauma incidents.

| Nationalities | Total number of cases (n) | Percentage (%) |
|----------------------|---------------------------|----------------|
| India | 825 | 25.2 |
| Pakistan | 559 | 17.1 |
| UAE | 507 | 15.4 |
| Egypt | 242 | 7.4 |
| Bangladesh | 130 | 4 |
| Philippine | 109 | 3.3 |
| Syrian Arab republic | 84 | 2.6 |
| Jordan | 64 | 2 |

There is a significant difference between the total number of cases in April 2019 and 2020. A significant finding in this analysis is the fact that there were higher rates of stab wounds and other injuries during the lockdown phase in April 2020. In addition to that, we found that suicide rates and assault rates were higher during that time as well in comparison to the non-lockdown phase. During the non-lockdown phase, the motor vehicle accident rates were higher in comparison to the lockdown phase (10.5% and 6.5%, respectively) with p -value <0.001 . This can be related to the restriction of driving during that time and less traffic in the country.

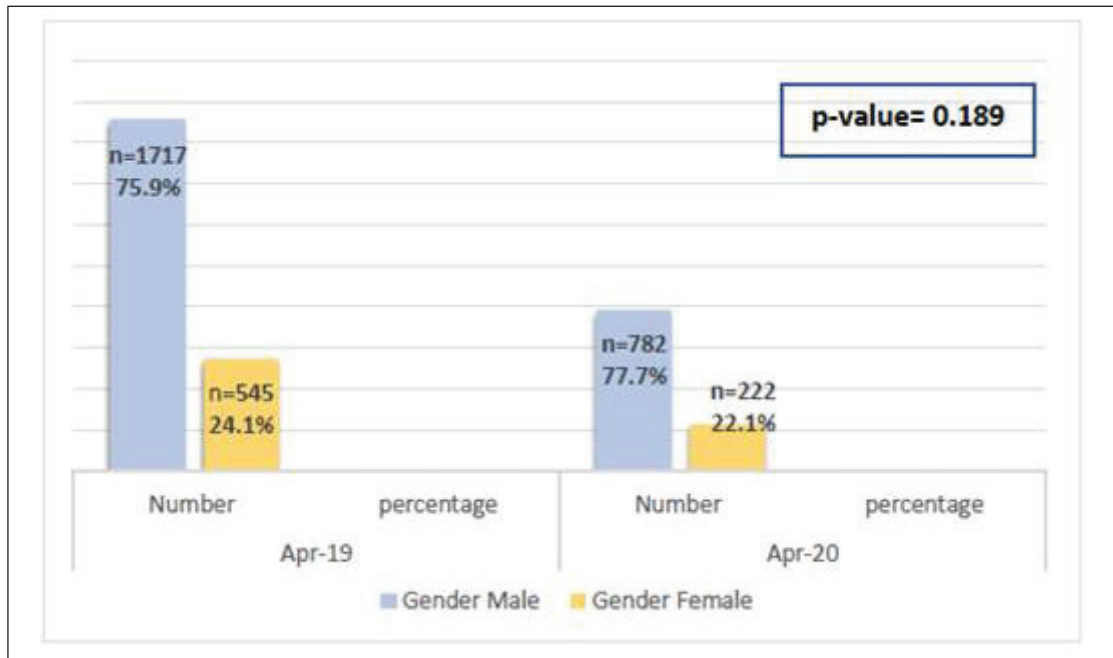


Figure 3. Frequency of patients based on gender in April 2019 versus 2020.

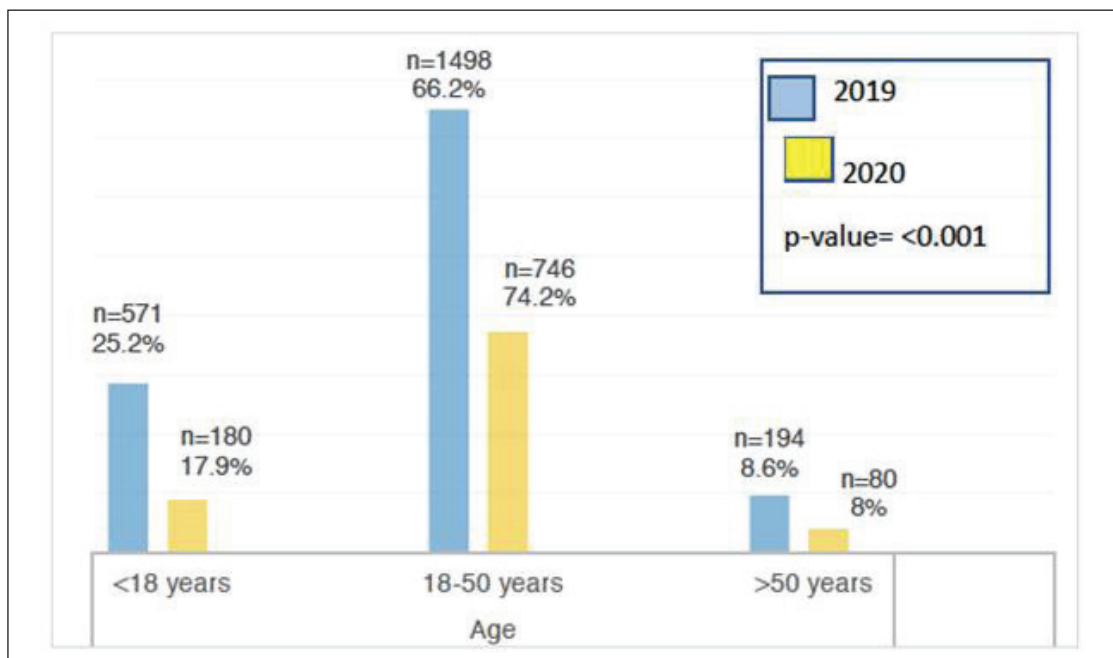


Figure 4. Frequency of patients based on age in April 2019 versus 2020.

Table 4 elaborates on the mode of transportation the patients used and compares them between the two April months. We expected to have a higher percentage of ambulance use than a private car during the lockdown, but the results show the opposite.

CT polytrauma is requested for moderate to severe mechanism of injury. Our study reveals that there is a significant difference in the total number of cases who underwent the CT polytrauma (p -value 0.04). The study reveals that 2,169 patients in April 2019 underwent CT polytrauma, but in 2020, only 979 patients underwent CT polytrauma (Table 5).

The trauma severity was further studied in our research. Here we compare the variables in April of 2019 and 2020. The variables include the Glasgow Coma Scale (GCS) of the patients and the trauma severity index of the patient which was calculated using Medcalc online.

The data analysis showed no significant difference between 2019 and 2020 in head injuries using the Glasgow coma scale to measure (p -value 0.29). There is 1 case missing in the data as there was no value for GCS mentioned in the records. The majority of the cases who presented to the ED had moderate severity of index in 2020 (p -value <0.001) (Table 6).

In both years, that majority of the cases were discharged home while a small percentage needed hospital admission (p -value 0.44) a very small percentage of the admitted patients required Intensive Care Unit (ICU) care, there is no significant difference between the 2019 and 2020 years (p -value 0.72). There was a mild increase in the mortality rate in 2020 than 2019 (0.1% and 0.2%, respectively) which was not significant (p -value 0.405) (Table 7).

Discussion

During COVID-19 stringent measures were taken to curb the spread of the virus among the population and to break the transmission lines. One of these stringent measures was lockdown, which directly led to a decrease in road traffic accidents and hence reduction in the trauma cases in the emergency department. However, on the contrary, evidence of an increase in the number of trauma patients was observed. This study aimed to assess the incidence of trauma cases during the COVID-19 lockdown in comparison to the corresponding pre-COVID-19 era.

This study reveals a 39.2% reduction in injury occurrences overall which complements the reports from other Emirates in the UAE's police force reporting a decrease in road traffic accidents with an 84% decrease in Sharjah, 46% decrease in Dubai, and 45% decrease in Ajman a 45% [8,11]. Yasin et al. [6] showed through

Table 3. The frequency of patients based on the mechanism of injury and pattern of trauma in April 2019 versus 2020.

| Variables | April 2019 | | April 2020 | | p -value |
|-------------------------|------------------------|------------------------|------------------------|------------------------|------------|
| | Frequencies (n) | Frequencies (%) | Frequencies (n) | Frequencies (%) | |
| Motor vehicle accident | 238 | 10.5 | 65 | 6.5 | <0.001 |
| Motorbike accident | 106 | 4.7 | 29 | 2.9 | <0.001 |
| Fall | 986 | 43.6 | 426 | 42.3 | <0.001 |
| Stab wounds | 14 | 0.6 | 19 | 1.9 | <0.001 |
| Pedestrian accident | 44 | 1.9 | 3 | 0.3 | <0.001 |
| others | 875 | 38.7 | 463 | 46.0 | <0.001 |
| Trauma intension | Frequencies (n) | Frequencies (%) | Frequencies (n) | Frequencies (%) | |
| Accidental | 2,103 | 93.1 | 879 | 87.5 | <0.001 |
| Suicidal | 4 | 0.2 | 5 | 0.5 | <0.001 |
| Assault | 151 | 6.7 | 121 | 12.0 | <0.001 |

Table 4. The frequency of the mode of transportation used in April 2019 versus 2020.

| Variables | April 2019 | | April 2020 | | p -value |
|--------------------|-----------------|-----------------|-----------------|-----------------|------------|
| | Frequencies (n) | Frequencies (%) | Frequencies (n) | Frequencies (%) | |
| Ambulance | 516 | 22.8 | 110 | 10.9 | <0.001 |
| Medical helicopter | 9 | 0.4 | 0 | 0 | <0.001 |
| Private car | 1,600 | 70.7 | 875 | 87 | <0.001 |
| Walk in | 137 | 6.1 | 21 | 2.1 | <0.001 |

Table 5. The frequency of polytrauma CT scan requests in April 2019 versus 2020.

| Variables | April 2019 | | April 2020 | | p -value |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|------------|
| | Frequencies (n) | Frequencies (%) | Frequencies (n) | Frequencies (%) | |
| CT polytrauma performed | 2,169 | 95.8 | 979 | 97.3 | 0.04 |
| CT polytrauma not performed | 94 | 4.2 | 27 | 2.7 | 0.04 |

Table 6. The frequency of trauma severity and traumatic brain injury, in April 2019 versus 2020.

| Variables | April 2019 | | April 2020 | | p-value |
|------------------------------|-----------------|-----------------|-----------------|-----------------|---------|
| | Frequencies (n) | Frequencies (%) | Frequencies (n) | Frequencies (%) | |
| GCS | | | | | |
| Normal GCS 15/15 | 2,216 | 98.0 | 991 | 98.5 | 0.29 |
| Mild GCS 13–14/15 | 23 | 1.0 | 10 | 1.0 | 0.29 |
| Moderate GCS 9–12/15 | 9 | 0.4 | 4 | 0.4 | 0.29 |
| Severe GCS <= 8/15 | 13 | 0.6% | 1 | 0.1% | 0.29 |
| Trauma severity index | | | | | |
| Mild | 2,179 | 96.4 | 925 | 91.9 | < 0.001 |
| Moderate | 76 | 3.4 | 79 | 7.9 | < 0.001 |
| Severe | 5 | 0.2 | 2 | 0.2 | < 0.001 |

Table 7. The frequency of patient’s disposition and outcome in April 2019 versus 2020.

| Variables | April 2019 | | April 2020 | | p-value |
|------------------------|-----------------|-----------------|-----------------|-----------------|---------|
| | Frequencies (n) | Frequencies (%) | Frequencies (n) | Frequencies (%) | |
| Disposition | | | | | |
| Discharge | 2,024 | 89.5 | 909 | 90.4 | 0.44 |
| Admission | 238 | 10.5 | 97 | 9.6 | 0.44 |
| ICU requirement | | | | | |
| Yes | 16 | 0.7 | 6 | 0.6 | 0.72 |
| No | 2,247 | 99.3 | 1,000 | 99.4 | 0.72 |
| Outcome | | | | | |
| Alive | 2,261 | 99.9 | 1,004 | 99.8 | 0.405 |
| Dead | 2 | 0.1 | 2 | 0.2 | 0.405 |

a study conducted in AL-Ain City that the annual hospitalization rate due to road traffic collisions caused by COVID-19 lockdown measures decreased by 33.5%. A study done in King Suad Medical City showed a significant drop in road traffic injuries by 42.7% [7]. In addition, a retrospective study done in South Africa found a reduction in the number of trauma cases by 47% [12]. Thornton [13] observed a reduction of general accident and emergency presentations in England of 25% in the week that followed the implementation of their national lockdown. All these studies complement the findings of our study and this reduction in road traffic accidents can be attributed to a significant decrease in traffic due to lockdown restrictions.

In terms of the mechanism and pattern of injuries, there was a significant reduction in the percentage of motor vehicle injuries and motorbike accidents, while the percentage of injuries caused by sharp objects in the workplace was elevated. This finding can be explained by the fact that work-related injuries are common among laborers who essentially worked on a daily basis and were asked to continue their work as usual during the Pandemic. According to a study conducted in Al-Ain, motorcycle accidents increased during the lockdown because food service delivery was permitted during the restriction [6]. This could be explained by the exponential increase in online food delivery and shopping during the pandemic.

In addition, our study revealed an increase in the proportion of assaults that occurred during the lockdown. Our finding was supported by other studies showing the adverse psychological effects of COVID-19 on people. A multicenter study conducted in the United States found

a significant increase in gunshot and stab wound trauma in urban and suburban areas, respectively [4]. Also, the study found that during the lockdown, there was a statistically significant difference between the percentage of injured patients brought to the hospital by car and those brought by ambulance. This decline may be attributable to the fact that emergency medical services were focused primarily on COVID-19 patients in response to the widespread COVID-19 infections [7]. Even though the overall percentage of trauma severity index was higher before the Pandemic, there was no significant difference in ICU admission and mortality.

This study has certain limitations. First, the study was conducted in a single center, which limits our results’ generalizability and may not represent the entire UAE region. Second, the duration of the study was short; consequently, it is uncertain how this will change over time. Third, the study was based on medical records, so the majority of injury details were insufficient. Finally, other factors that may affect the outcome along with lockdown measures were not assessed.

Conclusion

Our study has shown that injury occurrence was reduced by 39.2% during the COVID-19 pandemic compared with the pre-pandemic period in our hospital. The percentage of motor vehicle injuries and motorbike accidents was reduced during the lockdown, while the percentage of injuries caused by sharp objects in the workplace increased. Even though the overall percentage of trauma severity index was higher before the pandemic, there was no significant difference in ICU admission and mortality.

Conflict of interests

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding

None.

Consent to participate

Not applicable.

Ethical approval

Ethical approval was granted by the Ethics Committee/ Institutional Review Board/Research Committee via reference/letter number DSREC/RRP/2021/36; dated: 12 December 2021.

Author details

Farnoosh Jalaluddin Farzin¹, Fatima Shire², Zahra Kasim AlDhuhaihat², Mariam Isa Jaafar³

1. Emergency Medicine Resident, Rashid Hospital, Dubai Academic Health Corporation (DAHC), Dubai, UAE
2. Emergency Medicine Specialist, Rashid Hospital, Dubai Academic Health Corporation (DAHC), Dubai, UAE
3. Former Intern in Emergency Medicine, Rashid Hospital, Dubai Academic Health Corporation (DAHC), Dubai, UAE

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