



Original article

The effects of the COVID-19 lockdown and alcohol restriction on trauma-related emergency department cases in a South African regional hospital

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ABSTRACT

The **objective** of this study was to compare the effect of the Covid-19 lockdown and the alcohol restriction on the number of cases that presented to the Emergency Department (ED) with the same time period two years prior. The **method** used was a retrospective review of medical records, directly comparing the types and numbers of trauma cases as well as non-trauma cases that presented to the ED in March and April 2020 with the same period two years prior. Our **results** showed a reduction during both months of lockdown compared to the same time period in 2018 with trauma cases in March 2020 down 33.14% and April 2020 down 57.93%. The non-trauma ED cases were down 2.52% in March and 37.43% in April compared to two years prior. When comparing only the last 6 days of March, a significant percentage decrease is visible as trauma cases fell from 20.79% in 2018 to just 8.58% of the total cases in 2020. In **conclusion**, our data showed a significant reduction in almost all types of ED cases during the lockdown period, but most significantly in trauma-related cases which was likely due, *inter alia*, to the prohibition of alcohol sales, gatherings and unnecessary travel.

African relevance

- This study was done in the Emergency Department of a South African hospital and paints a scenario that occurs in many hospitals not only in Southern Africa but across the continent.
- Trauma cases and alcohol-related injury affect many countries in the continent and around the world.
- The Covid-19 pandemic affected virtually the entire world and Africa was amongst the hardest hit both by the disease itself and the economic ramifications that followed.
- Other African countries also implemented lockdown-type regulations to mitigate the Covid-19 pandemic and its spread.

Introduction

The Coronavirus disease of 2019 (COVID-19) and the resultant pandemic has been an unprecedented event in recent history, with its effects being felt across all spheres of society. The respiratory virus, which is highly contagious, has spread rapidly across the world leading

to widespread infection, morbidity and even mortality. A multitude of strategies have been employed in order to mitigate, not only the spread of the virus, but also the concomitant demand for health resources, which has had an effect on the economy and on general daily activities. Some countries have implemented stringent COVID-19-related regulations while others have opted for a more relaxed approach to dealing with the virus [1,2].

South Africa, in particular, has implemented a relatively “strict” approach to this pandemic, which includes a risk-determined, level-based system of lockdown. This system includes various level-based restrictions which, amongst other things, prevents the sale of goods deemed as “non-essential”. The highest levels, namely level 5 and 4, included a prohibition on the sale of alcohol and tobacco products, as well as the restriction of mass gatherings and travel, except for essential workers and essential activities in terms of the regulations promulgated under the State of Disaster Act. The lockdown officially began on 26 March 2020 and is still ongoing at present [2].

South Africa’s public healthcare system is severely under-resourced and hospitals have struggled to manage the ordinary trauma burden,

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even prior to the COVID-19 pandemic [9].

While the primary aim of these regulations was to reduce the rate of new infections and slow down the spread of the virus, one of the other objectives was also to “manage” the demand on already strained healthcare system.

This particular study was conducted with the aim of comparing the number of trauma- and non-trauma-related cases seen at the Pholosong Regional Hospital Emergency Department during the lockdown period in March and April 2020 when compared to the same period in 2018.

Pholosong Regional Hospital Emergency department is a 24 hour facility that sees on average 3246 patients per month during the initial quadrimesters of the years 2018, 2019 and 2020, with the maximum number of monthly patients seen during that period being 4506 (April 2019) and the minimum being 2195 (April 2020). Of this total, on average 16.1% are trauma-related cases.

Method

This is a single-centre, observational study that involved a retrospective review of medical records. We directly compared the numbers and variety of trauma-related patients seen during the lockdown period in March and April 2020, with the same time period two years prior. No added criteria or exclusions were utilised and the data is a direct comparison therefore preventing bias. Non-trauma ED patients were also studied and used as a comparison but patients whose primary complaints were not injury-related were excluded from trauma section of the study. A significant limitation to our study was the lack of adequate trauma records from the year 2019. Another setback was that during data population, records department does not separate patients according to gender or age and thus we were not able to add these demographics. Ideally, these would have been included in our study to make it more robust and to compare the trend over the same period in three different years.

Results

As illustrated in Fig. 1, the majority of trauma-related injuries, with the exception of burns and crush injuries, reduced during the lockdown period. The most significant reduction is seen in the month of April as cases dropped from 592 in 2018 to 249 cases in 2020, down by 57.93%. Trauma cases in March were also reduced by 33.14% from 673 cases in 2018 to 450 in 2020 (partial lockdown). When we take into account only the days in which the lockdown was active, namely the last 6 days of March, we notice that 2020 only had a total of 53 trauma cases

compared to 163 cases in 2018. This is a 67.48% reduction.

Trauma cases in March 2020 (partial lockdown) made up 12.01% of the total patients seen in the ED, down from 17.51% in March 2018. The month of April 2020 also saw a reduction in trauma cases, as just 11.34% of the total patients seen in the ED were trauma-related, which was down from 16.88% in April 2018. In the period of 26–31 March 2018, trauma cases made up a significant 20.79% as opposed to just the 8.58% of cases during the same period in 2020.

The total number of patients seen in the ED, illustrated in Table 1, was down significantly in April 2020 to just 2195 from 3508 in the same month in 2018. This is a reduction of 37.43%. March 2020 (partial lockdown) only saw a 2.52% reduction in total patient numbers when compared to March 2018. But again if we take into account just the 6 days of March that fell into the lockdown period, we notice that this results in a 21.07% reduction in 2020 compared to the same period in 2018.

Discussion

The implementation of the lockdown regulations has changed the way people use and access healthcare facilities. While most hospitals

Table 1
Patient numbers and mechanisms of trauma cases seen in ED.

	1–31 March 2018	1–31 March 2020	1–30 April 2018	1–30 April 2020	26–31 March 2018	26–31 March 2020
Soft tissue injury (assaults ^a)	296	54	146	65	75	12
Burns	26	29	27	29	4	8
Crush	3	3	0	5	1	2
Bites (human/animal)	33	19	28	17	8	5
Gunshots	10	4	12	4	2	2
Head injury	33	10	29	3	8	0
Soft tissue injury (MVA ^b)	114	190	187	20	20	4
Orthopaedic ^b	125	123	135	83	29	18
Stabs	33	18	28	23	16	2
Total patients	673	450	592	249	163	53

MVA - motor vehicle accident.

^a Excluding head injuries.

^b Includes fractures, tendon and isolated hand injuries.

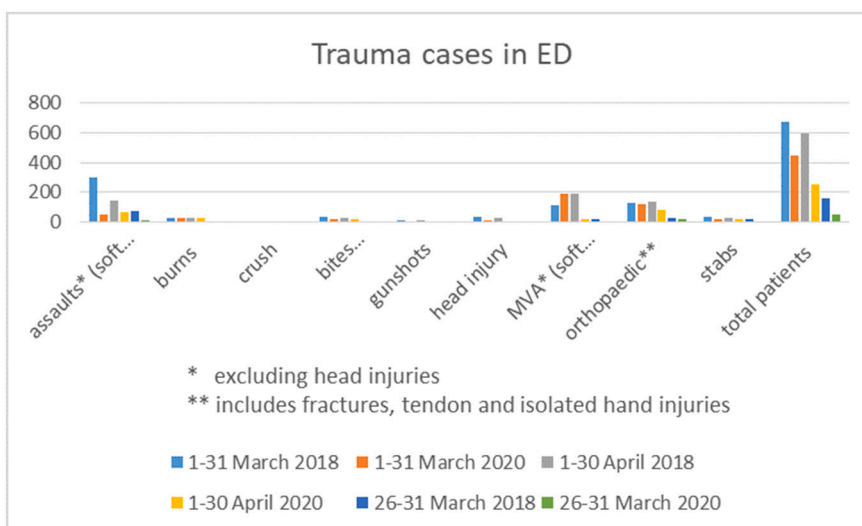


Fig. 1. Graphical representation of patient numbers and type of trauma cases seen.

and clinics around the world are still functioning and treating patients as per normal, or with slightly reduced capacities, the amount of people visiting these facilities for non-COVID-19-related reasons has reduced significantly [3] (Table 2).

One of the most significant reductions that has been noted is in the number of trauma patients presenting to the Pholosong Regional Hospital, in particular, the Emergency Department (ED). This 570 bed hospital is a moderately sized, regional hospital in the East Rand area of the Gauteng Province, South Africa. The hospital serves a population of more than 900,000 people in its catchment area and, as such, regularly deals with a variety of trauma and alcohol-related cases [4].

Emergency departments around the world see significant alcohol-related visits on a regular basis, with these cases placing a huge burden on these facilities. This burden is not only limited to human or financial resources, but can also lead to psychological and even physical strain on healthcare workers [5].

In addition to the above, patients who present with alcohol-related injuries generally have an increased length of stay in the ED, when compared to non-alcohol related patients. Time is a precious resource in emergency medicine and a few minutes can mean the difference between life and death, especially in a resuscitation situation [6].

Alcohol-related trauma in particular, is also a significant challenge to pre-hospital healthcare service providers. McNicholl et al., showed that up to 29% of cases that present to EDs on weekends are in some way alcohol-related, with a large number of patients making use of ambulance services to transport them to hospitals and other healthcare facilities. The study was also able to illustrate that these patients are more likely to leave the hospital, against medical advice in some cases, even before being seen by a doctor. This is not only a waste of time and valuable resources, but it also places these patients at risk of being incorrectly diagnosed or of not receiving the necessary treatment for their condition, which will undoubtedly have a negative impact on their morbidity and mortality [7].

Data collected from emergency departments also show that patients with alcohol-related traumatic injuries tend to have more severe injuries than non-intoxicated controls, in particular when it comes to injuries that involve the head and face [8].

When comparing the number of trauma cases seen for each respective month during the different years, one can appreciate that the month of April had a far greater decline than the month of March during the lockdown period. One can also see that the total patient numbers seen in the ED were also reduced, and as with the trauma cases, more significantly during the month of April 2020. However, the month of March

2020 only saw a 2.52% reduction when compared to the same month in 2018. But if we take into account just the 6 days of March that fell into the lockdown period, we notice that this results in a 21.07% reduction in 2020 compared to the same period in 2018. In April, the total patient numbers were reduced by 37.43%, yet the total trauma patients were reduced by 57.93%. Thus trauma cases were more significantly reduced when compared to non-trauma cases.

There are multiple factors that may have contributed to this pattern. One reason for this variability is that the lockdown only commenced towards the end of March 2020 and, as such, the month was only partially affected by the lockdown regulations. Furthermore, aside from the banning of alcohol and gatherings, there was progressive public awareness of the dangers associated with COVID-19 as significant public education efforts were made by governments around the world, including South Africa. As such, many people became more adherent to the lockdown regulations in the subsequent weeks than was the case initially. This was also compounded by stricter enforcement of lockdown regulations by security forces, including the police as well as the army who were deployed by the national government to maintain order [10,11].

April 2020 saw the most significant reduction in trauma, in particular with regard to soft tissue injuries caused by motor vehicle accidents (MVA), which declined by 89.3% and head injuries which declined by 89.6%. Both of these injury types have significant impacts on morbidity and mortality. An interesting finding is that March 2018 had two public holidays compared to only one in 2020 and April 2018 had two public holidays compared to the three in April 2020. This means that even with an additional holiday, the trauma cases still decreased [6,7,9].

Another interesting finding is that crush injuries actually increased during the study period from 0 cases in April 2018 to 5 cases in April 2020. This may be due to the socio-economic strain caused by the lockdown regulations, as crush injuries are commonly related to mob justice assaults in communities [13]. Further investigation is needed in order to ascertain the true reason for this increase, which falls outside of the scope of this paper.

One limitation of this study is that it was not possible to separate alcohol-related trauma from non-alcohol related trauma and, as such, determine the direct correlation of the alcohol ban on trauma cases. Other shortcomings include not being able to compare the demographics of the trauma, in particular age and gender, as well as not being able to separate paediatric trauma from adult trauma ED cases due to the lack of data.

Conclusions

Our data, although limited, shows a significant reduction in almost all types of ED cases during the lockdown period, but most significantly in trauma-related cases during the lockdown period as compared to the same period in 2018 just two years prior. The reduction in numbers is most likely attributable to the COVID-19 lockdown regulations which included, *inter alia*, a prohibition on alcohol sales, gatherings and unnecessary travel.

The Presidency announced that as of 1 June 2020, South Africa would move into level 3 of the lockdown which, amongst other things, allowed for the sale of alcohol for private consumption, as well as the opening of places of worship with a limited number of congregants [12]. It remains to be seen if this will result in an increase in the trauma cases that present to our ED and, as such, a follow up study will be required to assess the outcome.

While the world continues to battle the COVID-19 pandemic and the effects thereof, it is reassuring to know that there have been some “positive” outcomes which, even though inadvertent, have resulted in the saving of lives, the targeted use of resources and has assisted in the battle against the high rates of traumatic injury that plague our country. It is our hope that this data will be of benefit to South Africa as well as to other countries, not only in Africa but around the globe, when planning

Table 2

Pholosong Regional Hospital Emergency Department patient statistics (added more data to give better representation of trauma cases out of total ED cases as well as total patient numbers).

Pholosong Hospital Emergency Department						
Data/Period	Mar-18	Mar-20	Apr-18	Apr-20	26–31 Mar-18	26–31 Mar-20
Casualty - Death	8	12	12	12	N/A	N/A
Casualty headcount - After hours	1873	2811	1635	1569	361	308
Casualty headcount - Normal hours	1963	924	1861	614	423	310
Total patients	3844	3747	3508	2195	784	618
Non-trauma patients	3171	3297	2916	1946	621	565
Trauma patients	673	450	592	249	163	53
Percentage of non-trauma patients (%)	82,49	87,99	83,12	88,66	79,21	91,42
Percentage of trauma patients (%)	17,51	12,01	16,88	11,34	20,79	8,58

and forming regulations to deal with both the current as well future pandemics.

Dissemination of results

The above findings were shared with management at the Pholosong hospital and were published in issue 8 of the Pholosong Hospital newsletter which was published on 12/06/2020.

Authors' contributions

Authors contributed as follow to the conception or design of the work; the acquisition, analysis, or interpretation of data for the work; and drafting the work or revising it critically for important intellectual content: MA contributed 60% and MM 40%. Both authors approved the version to be published and agreed to be accountable for all aspects of the work.

Declaration of competing interest

The authors declared no conflict of interest.

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