

The effect of COVID-19 lockdown on the incidence of deliberate self-harm injuries presenting to the emergency room

The International Journal of
Psychiatry in Medicine
0(0) 1–12

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DOI: 10.1177/0091217420982100

journals.sagepub.com/home/ijp



Nader Henry¹ , Sunil Parthiban¹
and Azzam Farroha¹

Abstract

Objective: The World Health Organization declared COVID-19 a pandemic on 11th March 2020. The UK government introduced strict social distancing measures on 23rd March 2020, with the country put into a full lockdown to further halt the spread of the virus.

The aims of this article are to ascertain whether there was a rise in the incidence of deliberate self-harm (DSH) presentations to the emergency department at a level one trauma center associated with the introduction of lockdown measures.

Method: An observational study from a level one trauma center was carried out. Retrospective data from 23rd March 2020 to 1st May 2020 was collected and compared to the same time period in 2019. Data was collected from coded electronic patient records.

Results: Total attendances to the Emergency Department (ED) reduced from 2019 to 2020 (5198 and 3059 respectively). There was a significant increase in the total number of self-harm presentations between 2019 and 2020 (103 vs 113, p -value < 0.001) as well as paracetamol, NSAID and opiate overdoses, with more cases requiring hospital admission in 2020 vs 2019.

¹University Hospitals Birmingham NHS Foundation Trust, Birmingham, UK

Corresponding Author:

Nader Henry, University Hospitals Birmingham NHS Foundation Trust, Mindelsohn Way, Birmingham B15 2TH, UK.

Email: nader.henry@nhs.net

Conclusions: Societal lockdown measures secondary to the COVID-19 pandemic have had a significant effect on the mental health of patients. One way this can be detected is through an increased incidence and severity of deliberate self-harm injuries presenting to the ED. These findings, in conjunction with the available, literature provide valuable implications for community and emergency physicians and psychiatrists for any future wave of disease or pandemic.

Keywords

COVID 19, deliberate self-harm, trauma, mental health

Introduction

The World Health Organization declared COVID-19 a pandemic on 11th March 2020.¹ A novel strain of coronavirus, originated from zoonotic species, appeared in Wuhan, China and spread across the globe. The virus has a higher fatality rate than that of influenza and is more contagious.^{2,3} Not only does COVID-19 represent the most serious public health threat seen in a respiratory virus since the 1918 H1N1 influenza pandemic, but the economic repercussions globally have led to further crisis.⁴ The challenge of containing the virus has resulted in various differing strategies worldwide. At the time of writing this article, no pharmacological treatments have definitively been identified. As such, the world has turned to non-pharmacological interventions, based on epidemiological modelling, to contain the spread of the virus.⁵ The principle aim of these measures is to protect the most vulnerable in society and ease demand on healthcare systems.³ These social distancing measures, adopted by numerous countries, have thus far proved effective in reducing spread and mortality.⁶ Strict measures were introduced by the UK government on 23rd March 2020, with the country being put into a full lockdown.⁷ These measures included limitations on non-essential travel, working from home where possible, closure of schools and non-essential businesses, limits on outdoor exercise, and the concept of social distancing. This resulted in fewer presentations to Emergency Departments (ED) nationally by as much as 49%. It is unclear, however, whether there was less disease as a result of limited movement, whether diseases were being managed differently, or whether people stayed at home with diseases that should be treated.⁸

Although the effects of COVID-19 on mental health are still being evaluated, they are expected to be severe.³ Previous epidemics such as SARS in 2003 and Ebola in 2014 demonstrated widespread fear among the general public.^{9,10} Generalized anxiety, medical mistrust, stigmatisation and post-traumatic stress disorder amongst those who survived the disease and healthcare workers,

have also been reported.³ There are additional concerns societal lockdown introduces new medical challenges. Enforcing isolation and introducing a heightened perception of risk of death and illness can directly exacerbate mental health problems such as anxiety, depression and cognitive decline, particularly in the more vulnerable populations such as adolescents and the elderly, as well as an increase in suicidal ideation, suicide attempts and deliberate self-harm (DSH).^{11,12} DSH can be defined as the intentional act of non-fatal self-poisoning or self-injury, regardless of motivation.^{13,14} The aims of this article are to ascertain whether there was a significant rise in the incidence of deliberate self-harm presentations to the ED at a level one trauma center during the lockdown period. This study was carried out at the Queen Elizabeth Hospital Birmingham (QEHB) in Birmingham, UK. The hospital is a world-renowned level 1 trauma center and operates as the major trauma center for the West Midlands. During the COVID-19 pandemic, the hospital has also operated as the regional COVID-19 center.

Method

Retrospective data was collected from a 40-day period, from 23rd March to 1st May 2020, and compared to data from the same time period in 2019. Data was collected from coded electronic patient records (EPR) using two hospital operating systems. Patients included in the study were all those over 18 presenting to our institution via the ED, during each of the above time periods, who were given a diagnosis of DSH. Patients admitted to the ED are registered using the 'Oceano Patient Administration System' (Oceano) operating software. All patients admitted to the hospital from the ED are then registered onto the 'Prescribing Information and Communications System' (PICS).

For each time period, all patients presenting to the ED with any coded diagnosis of DSH, according to NHS Accident and Emergency Commissioning Data Set diagnosis codes, were identified. The DSH-related codes used by the 'Oceano' operating system at QEHB included; 'wound;laceration', 'paracetamol overdose', 'NSAID overdose', 'antidepressant overdose', 'benzodiazepine overdose' and 'opiate overdose'. As per hospital policy, all patients presenting with DSH are referred to the Liaison Psychiatry team. Therefore, to detect all patients presenting with DSH, and not due to accident or other causes, only patients with any of the above diagnosis codes and a subsequent code for referral to Liaison Psychiatry were selected. Total numbers of patients presenting to the ED during each time period were recorded from 'Oceano'.

As patients admitted to hospital for treatment may not have been referred to the Psychiatry team by ED staff, but later by their admitting team, all patients admitted during the above time periods, that were subsequently referred to Liaison Psychiatry via the 'PICS' program were also identified. This method

also identified patients who had harmed themselves in ways not coded by the ED software, e.g. self-immolation.

All duplicate patient records across both lists and patients under 18 were excluded from the study. Demographic data for all patients including age, gender, ethnicity, all previous mental health diagnoses and previous number of presentations to the ED for each patient were recorded. Finally, discharge destinations for each patient were recorded.

Overall, numbers of DSH injuries identified by this method were compared to the total number of patients presenting to the ED during these two time periods and assessed for statistical significance. The data was analysed using 'Microsoft Excel' and 'SPSS' software systems. Statistical analysis was carried out by calculating a Z-score for each method of self-harm during the data collection period. In our analysis, the null hypothesis was that the proportion of diagnoses of DSH would be the same in 2019 and 2020 during the time period specified. The test statistic generated was correlated with the standard normal (Z-) distribution table to calculate the p-value.

Results

Total attendances to the ED reduced from 2019 to 2020 (5198 and 3059 respectively). There was a significant increase in the total number of DSH presentations between 2019 and 2020 (103 vs 113, p-value <0.001). The average age of patients was 35 in both cohorts.

While there has been a general increase in males presenting to ED compared to women between 2019 and 2020, a chi-square test of independence showed no significant difference between 2019 and 2020 (p=.063). Excluding the patients whose ethnicity was unknown, there was no significance in the rise in number of Black, Asian and Minority Ethnic patients attending ED (p=.198) (Table 1).

Paracetamol overdoses were the most common form of self-harm in both 2019 and 2020. There was an increase in presentations to the ED with paracetamol overdoses between 2019 and 2020 (33 vs 45 patients respectively).

Table 2 shows the frequency of diagnoses presenting in 2019 and 2020. In 2019, there were significant increases in incidence of paracetamol overdoses, opiate overdoses and NSAID overdoses during the lockdown period in 2020. All other forms of self-harm did not see any significant change compared to the total number of attendance that year.

In 2019, 64 patients did not require acute medical treatment for their injuries and were discharged home directly from ED following psychiatric review, while 39 were admitted for medical care. In 2020, 48 patients were discharged home directly from the ED with 65 patients requiring admission. No patients required transfer to an external psychiatric unit, whether from the ED or following medical treatment (Table 3).

Table 1. Breakdown of attendances to the Emergency Department by ethnicity and gender with a diagnosis of deliberate self-harm.

Ethnicity	Year			
	2019		2020	
	Female	Male	Female	Male
Asian or Asian British - Any other Asian background	1		4	5
Asian or Asian British - Indian		1		
Asian or Asian British - Pakistani	1	1		1
Mixed - Any other mixed background				1
Mixed - White and Black Caribbean	3	2	3	1
Not Specified	9	5	8	15
White - Any other White background	1	1		
White - British	49	29	41	32
White - Irish				2
Grand total	64	39	56	57

Table 2. Frequency table showing diagnoses of patients after referral to the liaison psychiatry team.

	2019	2020	Z-score	p-value
Total attendances	5198	3059		
Attendances with Liaison Psychiatry input	103	113	-4.71	<0.001*
DSH as percentage of total ED attendances	1.98%	3.69%		
Diagnosis				
Antidepressant OD	30	27	-1.62	0.053
DSH – wound/laceration	13	6	0.494	0.312
Paracetamol OD	33	45	-3.79	<0.001*
Opiate OD	6	13	-2.835	0.002*
Benzodiazepine OD	9	6	-0.237	0.405
Burn	4	2	0.188	0.425
Insulin OD	3	5	-0.149	0.068
NSAID OD	4	9	-2.40	0.008*
Salicylate OD	1	0	0.767	0.221

OD: overdose; DSH: deliberate self-harm. *p-value <0.05.

The majority of these patients were admitted for paracetamol overdoses in both years, however, 2020 did see a rise in admissions for other forms of overdoses. No patients presenting with a wound following DSH required admission. All burns presenting to the ED needed admission (Table 4).

Table 3. Breakdown of discharge destinations from the emergency department.

Discharge destinations from ED	2019	2020
Home	64	48
Admission to hospital	39	65
Transfer to psychiatric unit	0	0

Table 4. Frequency of admissions per diagnoses in 2019 and 2020.

Diagnosis	2019	2020
Insulin OD	3	5
Antidepressant OD	12	11
DSH – wound/laceration	0	0
Paracetamol OD	19	32
Opiate OD	0	9
Benzodiazepine OD	0	3
Burn	4	2
NSAID OD	0	3
Salicylate OD	1	0
Total	39	65

OD: overdose; DSH: deliberate self-harm.

Discussion

DSH is the intentional act of non-fatal self-injury or poisoning. It is common, especially between ages 15–35, but can also be present in the elderly.¹³ This phenomenon of DSH is also associated with an increased risk of suicide.¹⁵ The most common reason for DSH reported amongst adolescents is to gain relief from a poor mental state.¹⁶ DSH has also been associated with a number of life problems as triggers, such as relationship issues and addiction. Those who suffered with repeat episodes of DSH often reported housing difficulties, mental health problems and abuse.¹⁷ Due to the increased risk of suicide, aftercare of patients who have suffered from DSH is of utmost importance, with cognitive behavioral therapy (CBT) being the most effective treatment.¹³

There are multiple current theories that COVID-19 is associated with a negative effect on mental health, with anxiety being among the commonest presentation.^{18,19} As patients are isolated and removed from support networks including friends, family and medical professionals, stress and mental morbidity can worsen.²⁰ Furthermore, anxiety related to the disease pandemic and fear of death will further these symptoms.²¹ The resulting economic downturn, and the subsequent effect on people's livelihoods can further worsen this stress.

Deterioration in mental health can present in various ways, including DSH. The results of this study have shown an increase in DSH attendances to the ED during the lockdown period of 2020, compared with the same time period in 2019, despite overall attendances decreasing by 41%. One potential reason for this is the detrimental effect of the lockdown on mental health.

Various groups have been identified as vulnerable, during the COVID-19 pandemic, with regards to their mental health. These include those with prior mental health history, the elderly, pregnant women, the homeless, migrant workers, children and adolescents, people at risk of domestic abuse, lower socio-economic groups and frontline healthcare workers.¹⁸ The International Committee of the Red Cross stated that more than 600 incidents of violence, harassment and stigmatisation took place against healthcare workers and patients in relation to the COVID-19 pandemic.²² Fear, panic and misplaced anger can drive attacks on healthcare workers, which can further exacerbate pandemic-related stresses.²³ The elderly population has been advised to remain under isolation globally. According to the latest literature, the elderly population are at a greater risk of anxiety, depression and suicide as a result of isolation.^{24,25} With these groups in mind, it should be advised that General Practitioners and Psychiatrists contact their most at-risk patients to provide them with follow-up, reassurance and information on which services remain available.³

National lockdown can lead to confusion amongst patients regarding what services are still available to them. This may lead to patients not seeking medical attention prior to their condition becoming severe and resulting in DSH. Recommendations state that it is crucial that psychiatrists familiarise themselves with screening and triage procedures, and work closely with physicians and public health specialists to minimise risks their patients face.²⁶ Further provisions should also be made by EDs to increase capacity and facilities to deal with these presentations where possible.

As governments worldwide begin to consider relaxing lockdown measures, these findings carry implications for a potential future surge in the disease. It has been predicted that if a second wave of COVID-19 occurs and the economy is damaged further, the effects on mental health could be even greater and more prolonged, leading to a true mental health crisis.^{27,28} There is therefore need for both mental health services and the strengthening of social capital to take measures to reduce the psychological impact of the outbreak.²⁰ The inclusion of both large-scale psychosocial crisis interventions, and incorporation of mental health care in disaster management plans in the future will be crucial.²⁸ This may be in the form of an improvement in the quality and volume of available information regarding the pandemic, such as online resources²⁹⁻³¹ in efforts to reduce responses of panic and fear. Improved training for community physicians in basic aspects of mental health care^{29,32} and improving links between community and hospital services can ensure better continuity of care.³¹ Finally, improved

screening for mental health disorders³¹ and dedicated teams to follow up patients, deal with emotional distress³² and teach crisis management strategies³³ with a greater focus on CBT facilities¹³ are also suggested actions to mitigate the effects of a second surge. The National Health Commission of China have implemented teams of psychiatrists, mental health professionals and psychological support hotlines as part of their emergency psychosocial disaster interventions to reduce negative psychosocial outcomes of the pandemic.³

Globally governments have also acted to mitigate mental health issues such as launching financial aid schemes, social support programs and psychological protocol services for the survivors of COVID-19 through screening, online and telephone counselling services, and educational media campaigns to help spread accurate information about the pandemic.^{3,24,34–36}

The mean age of patients within the study was 35. This reflects the reported literature stating DSH is most common between ages 15–35.¹³ One UK-based multicenter study found that of 24,598 patients presenting with DSH, 57% were female and with a mean age of 33.1(17). The demographics in our study showed similarly equal proportions of men and women. Further work is required to investigate why vulnerable populations such as the elderly did not present in higher numbers as current literature suggests. Possible reasons include fear of healthcare institutions during the pandemic and difficulties in communication secondary to isolation.^{8,24}

Birmingham is the second largest city in the UK, with a population of 1.09 million people and diverse ethnicities. The predominant ethnicity is White (57.93%) with Asian (26.62%) and Black (8.98%) following. 4.4% of the population are of mixed ethnicities and 2.03% belong to other ethnic groups including Arab.³⁷ Previous literature has shown that Asian males are least likely to self-harm, with Black females being most likely.³⁸ The overwhelming majority of the patients in this study were White British, however, with the slight majority being male, which is more consistent with Birmingham's demographics than published literature.

There was a significant increase in paracetamol and NSAID overdoses during the lockdown. As COVID-19 has no pharmacological treatment, one theory attempting to explain this is that as symptoms of viral infection such as fever and myalgia can be commonly alleviated with paracetamol and NSAIDs, the general population may have increased their stock levels of these drugs in preparation, making these the drugs that were most accessible. Paracetamol overdose remains the most common drug used in DSH.³⁹ Opiate overdoses are not usually among the most common drugs involved in DSH, and yet were second most common during the lockdown period. In contrast, the established data shows benzodiazepines often being the second most common drug of abuse in DSH followed by aspirin and other NSAIDs. Further research needs to be carried out to establish the cause of this. It should, however, remain a consideration for physicians when prescribing opiates in the current environment,

especially when longer prescriptions are required due to difficulties faced by patients in acquiring medications due to lockdown.

Admission to QEHB following DSH was done solely for medical management; any further need for psychiatric support is carried out in neighboring psychiatric units. Within the 2020 cohort of DSH patients, 57.5% required hospital admission; this is in contrast to 37.9% in 2019. This may suggest that the degree of DSH injuries/illnesses in 2020 were more severe. One potential explanation for this is that heightened anxiety and poor mental health caused by the pandemic and associated measures led to more severe acts of DSH. Further comparison would need to be carried out to objectively compare the severity of injuries from year to year and exact reasons for admission.

There were some limitations to this study. Firstly, as the study only observed two cohorts of patients over two years, there may be further year on year variation that is not accounted. It may be that the 2019 cohort is an isolated anomaly and the usual incidence of DSH presentations was much higher in previous years, thus the 2020 result may no longer be statistically significant. This is a potential area of further study.

As stated, patients being admitted to QEHB often did not receive a referral to the liaison psychiatry team from ED staff. Diagnoses are coded based on nationally agreed codes while in the ED, however this is not the case for inpatients. These patients' diagnoses are written freehand by clinicians and later coded by administrators. This may have resulted in incorrect DSH coding, due to human error. This was mitigated by thorough review of all referral details to liaison psychiatry, and by keeping search criteria broad.

Furthermore, during the pandemic, a number of measures to improve patient flow through the ED were introduced. This included medical clinician clerking of evidently medical patients on presentation to hospital to reduce the workload of ED doctors. However, the PICS system had not been updated to reflect this new pathway, thus patients seen directly by the medical team would have been recorded as an admission, not an ED attendance. In 2020, 6 patients were discharged on the same day following admission for DSH. Of these, 2 patients took a paracetamol overdose, 2 an antidepressant overdose and 2 a benzodiazepine overdose. In 2019, only 1 patient was discharged on the same day as admission, following an antidepressant overdose. This skew in data may be due to the change in patient flow implemented during the pandemic. However, this change would not have caused any impact to the incidences of DSH presentations, which did increase during the COVID-19 pandemic. Future studies should consider the impact of wide-scale changes implemented during the pandemic at their local institutes when making comparisons to previous years.

It can be concluded that societal lockdown in the UK secondary to the COVID-19 pandemic has had a significant effect on the mental health of the population as reported in the literature. One way this effect may be detected is by an increased incidence of DSH injuries presenting to the ED. These findings,

in conjunction with the available literature, provide valuable implications for any future wave of disease or other pandemic.


Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Nader Henry  <https://orcid.org/0000-0002-4426-7626>

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