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The Impact of COVID Pandemic on Rates of Deliberate Self-harm in a Tertiary Hand Unit

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Abstract
Background: It is well reported that the COVID pandemic has had a significant impact on people's mental well-being. We aimed to explore the rates of hand injuries from deliberate self-harm (DSH) following the United Kingdom 'National Lockdown' and explore the incidence and clinical profile of patients.
Method: Demographics of patients who presented with deliberate self-harm injuries in the forearm and hand were collated. Impact on hospital services were also analysed. Pre-lockdown and post-lockdown groups were analysed over seven-month periods in 2019 and 2020. Data was collected using the electronic patient management system, "E-Hands" at the Queen Elizabeth Hospital, Birmingham.
Results: Expectedly there were far fewer patients presenting to the Hand Service in the 2020 time period, secondary to COVID-19 and behavioural changes. The number of patients presenting to the Hand Surgery Service with DSH in 2019 was 13 of 3885 (0.3%) total presentations, compared to 26 of 3226 (0.8%) in 2020 after the National Lockdown for COVID-19. This difference was statistically significant ($p = 0.008$). Both cohorts had equal rates depression. Significantly more patients had no previous history of DSH in the post-COVID group compared to pre-COVID (81% versus 7%; $p = <0.05$). There was no difference between the cohorts in terms of past mental health conditions ($p = 0.73$).
Conclusion: There has been a significant rise in deliberate self-harm injuries presenting to our Hand Surgery Service following the National Lockdown for COVID-19, despite reduced overall presentations. There were more patients who presented with self-harm for the first time. The economical, emotional, and psychosocial impact of COVID-19 on people's mental well-being is evident through this doubling in DSH presentations.

Key Words
COVID-19; Self-Harm; Mental Health; Hand Injuries

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Introduction

Deliberate self-harm is defined as a direct intentional injury to the body[1]. The resulting injury in the upper limb can vary from superficial lacerations to deep injuries involving tendons, nerves and blood vessels[2]. The latter can result in lifelong disability. The act is associated with mental health crisis and is often managed by both the psychiatric team and the hand surgery team concurrently.

The COVID-19 pandemic reached the United Kingdom by February 2020 at which point the World Health Organisation declared the outbreak a global pandemic[3]. To contain the virus, the UK government announced a 'National Lockdown' which had a dramatic change to people's livelihoods. The Government's new measures led to job losses, redundancies and completely changed the social dynamic in society. The longevity of these measures has had widespread implications for the UK population financially, socially, emotionally and psychologically. Patients with pre-existing mental health conditions such as depression and anxiety are particularly vulnerable[4]. Maladaptive behaviours, emotional distress and defensive responses have been described due to the psychological impact of the COVID-19 pandemic[5]. The repetitive exposure to negatively associated news has also reportedly had a negative impact on people's mood.[6] Overall, a combination of increased anxiety, public restriction and economic recession have negatively impacted global mental health and led to significant increase in suicide rates.[7]

The aim of this study is to explore the effect of COVID-19 on the prevalence of deliberate self-harm including the clinical profiles of patients, risk factors and severity of injury.

Methods

Patients who presented with deliberate self-harm injuries were separated into two groups. The COVID-19 cohort included any patient with DSH presenting between 16th March 2020 and 16th November 2020. A matched group preceding COVID-19 included any patient with DSH presenting between 16th March 2019 and 16th November 2019. Patients with lacerations distal to the elbow were included. Demographics including age, occupation, psychiatric history, social circumstances, and previous self-harm were analysed. Severity of injury and associated injuries were also recorded. DSH injuries to other body sites in the absence of upper limb injuries were excluded. Patients under the age of 16 were excluded.

Data was gathered from the electronic patient management system "E-Hands" at the Queen Elizabeth Hospital, Birmingham. The data were recorded on Microsoft Excel and analysed. Datasets were analysed using X^2 for the categorical variables; a p value of less then 0.05 was considered statistically significant. The null hypothesis was that the proportion of DSH in the months preceding the pandemic was not different for that after.

Result

The number of patients presenting to the Hand Surgery Service with DSH in 2019 was 13 of 3885 (0.3%) total presentations, compared to 26 of 3226 (0.8%) in 2020 after the National Lockdown for COVID-19. This difference was statistically significant (p = 0.008). There were far fewer patients presenting to the Hand Service in the 2020 time period, likely secondary to government restrictions and behavioural changes.

Both cohorts had similar distribution of patient gender with a male to female ratio 1.6:1 and 2.2:1 pre- and post-COVID-19, respectively. The average age of the patient was 37 in the 2019 group and 35 in the 2020 group. There was a larger proportion of unilateral injury in 2020 compared to 2019 (81% in 2020 vs 69% in 2019), but a lower number of bilateral injuries (19% vs 31%). However, this was found to not be statistically significant (p=0.42)

With regards to employment status before lockdown, 85% were unemployed and 15% had office-based jobs. Conversely, in the cohort after National lockdown, employment status was much more variable. (Figure 1). Following the lockdown, there was a shift of demographics to include ex-military, and the working class.

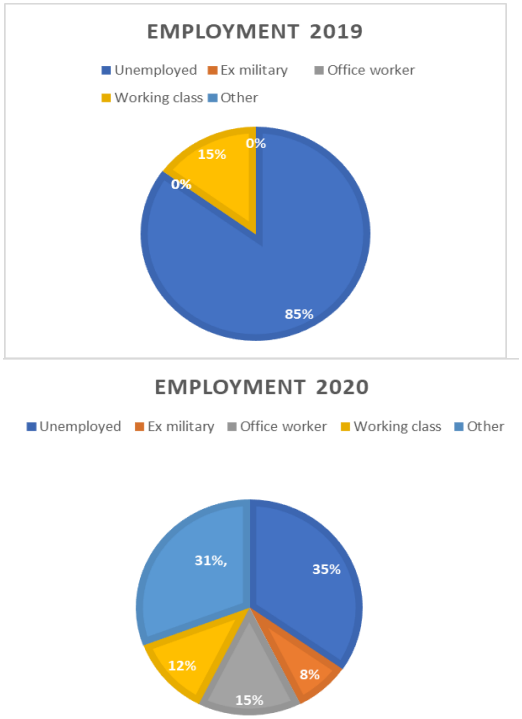

Figure 1: *Employment status - 2019 and 2020 cohort*

Significantly more patients had no previous history of DSH in the post-COVID group compared to pre-COVID (81% versus 7%; p = <0.05). The number of patients presenting with no pre-existing mental health history were 14% and 27% in the pre- and post-lockdown groups respectively. There were similar rates of depression between the two groups. There were no significant differences in terms of mental health history between the two groups (p = 0.73).

Discussion

The act of deliberate self-harm is an extreme form of mental health crisis. It is often considered a combination of factors such as pre-existing mental illness, genetic pre-disposition, family history and personality traits.[8]

In 1897, Emile Durkheim describes 4 types of suicide based on an imbalance of social integration and moral regulation, emphasising a link to increasing isolation and loss of family and community bonds[9].

It is unsurprising that in times of natural disasters and pandemics, there is a significant increase in suicide rates. The SARS virus pandemic in 2003 showed an increase of 31.7% suicide rate amongst those aged 65 and above[9–11], whilst Hurricane Maria

in Puerto Rico experienced an increase from 19 suicides per month to 25 in the immediate three months following the disaster.[12]

In the Birmingham Hand Surgery Unit, which sees on average 7440 patients a year, there has been a significant rise in patients presenting with DSH requiring surgical intervention since the start of 'national lockdown'.

Several predictive factors were identified as potential causes in this study. The COVID-19 pandemic poses a special challenge to physical[13–15], economic[16], mental and social health[17]. Social distancing measures, and loss of social interaction have caused loneliness amongst all ages which in turn is associated with increased anxiety and depression[18]. This population are particularly vulnerable to extreme suicidal thoughts which may explain the effect of the imposed quarantine on suicide rates[19]. Although a reduction of movement in population through lockdown measures have actively suppressed the spread of the virus, there has been an increase in prevalence of domestic violence which is strongly associated with suicide attempts[20–22].

There was a significant rise in patients with no previous history of DSH presenting to the Birmingham Hand Service despite no changes to the demographics in terms of average age and female to male ratios. Similar findings were reported in Canada, USA, Pakistan, India, France, Germany and Italy[19,23,24].

In recent years, a seasonal rise in suicide has been observed during the colder months and reduction in the warmer months. In the year 2020, there was a bimodal peak distribution of suicide rate. The first rise in the immediate 3 months following the first national lockdown with a peak just before the end of lock down in June. The second peak in suicide rates occurred in August, which correlates with the introduction of new restrictions. This was also seen in a real time surveillance study in England by the University of Manchester[25].

Occupation status is a generally good predictor of psychological distress. A meta-analysis of suicide by occupation found that those of lowest skilled occupation were at greater risk of suicide[26]. In this study, the majority of the DSH patients were unemployed before national lockdown measures, which was consistent with the findings of the meta-analysis. Comparatively, in the period after national lockdown, the employment status was much more variable in DSH patients. This could be explained by financial stress, loss of employment or an inability to provide. McIntyre and Lee[23] had similar findings with a projected increase in suicide rate from 418 per year to 2114 associated with joblessness in Canada.

Interestingly, this study observed a significant increase in patients with no previous history of DSH in the 2020 cohort. This demonstrates the intense emotional and psychological stress created by COVID-19 and its associated restrictions. It is well described that pre-existing mental health conditions are predictors for DSH. Depression was seen in both cohorts at similer rates. Anxiety and PTSD are often strongly associated with depression[27]. Factors which may cause or worsen this involve isolation, loss of routine structure, long term consequences of disability from COVID-19 and financial pressure [28,29]. In addition, some studies have found that prolonged exposure to social media and news information concerning COVID-19 have positively worsened symptoms of anxiety[30,31].

Limitations

There were a number of limitations in this study. Documentation regarding patients' mental heath history was poor due to the various documentation systems used in Birmingham. Therefore, specific details relating to the severity of the mental health were unavailable. Secondly, only patients who have deliberately self harmed by injury to the hand and wrist were included, thus this article is unable to account for other types of DSH such as neck injuries and burns which did occour in this time period. Finally, there was no available data on social circumstances of these patients as they were not recorded, the effect of death in the family and other social stressors were not included.

Conclusion

COVID-19 has had a negative effect on the economic, social and physical health of the population. This article highlights the significant impact on mental health and has demonstated a significant rise in DSH and a greater proportion of patients who had not harmed before. This demonstrates the impact of COVID on mental well-being and the importance in identifying and providing help early to those who are vulnerable.

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