

RESEARCH ARTICLE

Impact of the COVID-19 pandemic on suicide and self-harm among patients presenting to the emergency department of a teaching hospital in Nepal

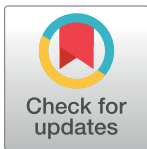
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Abbreviations: COVID-19, Coronavirus disease 2019; DH-KUH, Dhulikhel hospital-Kathmandu University Hospital; ED, Emergency Department;

Abstract

The COVID-19 pandemic is a global challenge that is not just limited to the physical consequences but also a significant degree of a mental health crisis. Self-harm and suicide are its extreme effects. We aim to explore the impact of this pandemic on suicide and self-harm in our Emergency Department. A cross-sectional study was conducted including all fatal and nonfatal self-harm patients presenting to the emergency department during the lockdown period (March 24–June 23, 2020; Period 1), matching periods in the previous year (March 24–June 23, 2019; Period 2) and 3 months period prior (December 24 2019–March 23, 2020; Period 3) were included through the electronic medical record system. The prevalence and the clinical profile were compared between these three periods. A total of 125 (periods 1 = 55, 2 = 38, and 3 = 32) suicide and self-harm cases were analyzed. Suicide and self-harm had increased by 44% and 71.9% during the lockdown in comparison to periods 2 and 3. Organophosphate poisoning was the most common mode. Females were predominant in all three periods with a mean age of 32 (95%CI: 29.3–34.7). There was a significant delay in arrival of the patients in period 1 ($p = 0.045$) with increased hospital admission ($p = 0.003$) and in-hospital mortality (18.2% vs 2.6% and 3.1%) ($p < 0.001$). Our study showed an increase in suicide and self-harm cases in the emergency department during the initial phase of the COVID-19 pandemic which may reflect the increased mental health crisis in the community in low resource settings like Nepal. This study highlights the importance of priming all mental health care stakeholders to initiate mental health screening and intervention for the vulnerable population during this period of crisis.

Introduction

The COVID-19 pandemic is presenting a global challenge not just in terms of infectious disease but also for mental health. The pandemic rapidly disseminated across the world with the

EMR, Electronic medical record; IRC-KUSMS, Institutional Review Committee, Kathmandu University School of Medical Sciences; LAMA, Leave against medical advice; OP, Organophosphate poisoning; SH, Self-harm; SPSS, Statistical package for the social sciences; SARS, Severe acute respiratory syndrome; SD, Standard deviation; IQR, Interquartile range; WHO, World.

first reported case in Nepal on January 25, 2020 and the first reported death on May 14, 2020 [1]. Nepal responded with a nationwide lockdown from March 24, 2020. The increasing number of infections and uncertainty induced a substantial fear and concern leading to stress and anxiety which was superimposed by lockdown restrictions, financial breakdown, lack of physical contact with other family members and friends [2]. The consequences of pandemic and lockdown on socioeconomic, mental health, and other aspects of Nepalese society are immense [3]. These alarming conditions may exacerbate the suicidal rate which is already high in our part of the world [4].

Suicide and self-harm (SH) are a serious public health problem; however, it is preventable with timely, evidence-based, and often low-cost interventions. Every year approximately 800 000 people commit suicide and many more attempt it. In 2016, it was listed as the second leading cause of death among 15-29-year-olds worldwide [4]. Nepal was ranked 7th by suicide rate globally in 2014. The World Health Organization (WHO) reports an estimated 6,840 suicides annually or 24.9 suicides per 100,000 people in our country [5]. In addition, civil conflict and the 2015 earthquake have had significant contributory effects [6, 7].

Recent studies conducted during the COVID-19 pandemic have revealed high levels of stress, anxiety, and depression in the community [8–10]. Previous studies conducted after the epidemic outbreak of Severe Acute Respiratory Syndrome (SARS) in 2003 revealed a significant increase in the elderly suicidal rate in Hong Kong [11]. Few publications reporting COVID-19 related suicide are published [12–16]. Increased cases of suicide have been reported in police stations all over Nepal since the lockdown period [17]. However, we found no publications in regards to COVID-19 related suicides presenting to the emergency department (ED) in developing countries. Most cases of SH present to the ED, therefore this study was done in an acute care setting to address this crucial issue related to mental health.

The objective of this study is to provide an overview of the impact of the COVID-19 pandemic and lockdown on the prevalence and clinical profile of suicide and SH in our ED. We compared the prevalence and clinical profile of SH in the ED during the COVID lockdown period in Nepal with the matching period of the previous year and the previous 3 months. We hope that all the stakeholders related to mental health will be primed to initiate mental health assessment and screening for the high-risk population and provide intervention for those needed during the period of crisis.

Materials and methods

Study design

This is a cross-sectional observational study of all consecutive fatal and nonfatal SH between March 24-June 23, 2020 (period of COVID lockdown -Period 1), matching periods in the previous year between March 24 and June 23, 2019 (Period 2) and 3 months period prior to the state of lockdown between December 24, 2019-March 23, 2020 (Period 3). The electronic medical records (EMR) were accessed on August 31st and the follow-up phone call were made from September 1st -September 11th 2020.

Setting

The ED of Dhulikhel hospital-Kathmandu University Hospital (DH-KUH) which has approximately 20,000 visits annually and has a high acuity level as per internal audits. Most of the patients with acute SH present to the ED. The patients presenting to the ED are immediately triaged, categorized into different levels according to the severity and directed towards different designated areas. Ethical approval was obtained from the Institutional Review Committee, Kathmandu University School of Medical Sciences (IRC-KUSMS-69/20).

Participants

Data of consecutive patients of all ages who presented to the ED during the study periods with any form of fatal or nonfatal SH including attempted hanging, impulsive self-poisoning, and superficial cuttings irrespective of the outcome were collected from EMR. The identity of the patients was kept confidential during the data retrieval and storage. The patients who were discharged or referred as per EMR were followed up with a telephone call by the two authors (SS1 and SS2) to enquire about the patient's final outcome. Verbal informed consent was taken before telephonic inquiry with the recipient of the phone call (patient if alive or the guardian if dead or minor). Only the query about the outcome (alive or death) of the SH cases was made during the inquiry. Incomplete data were excluded.

Variables

Variables studied were retrieved from EMR which included patient demographics (age, gender, address), mode of transportation, triage details, time to presentation in the ED, previous attempts of SH, past psychiatric illness, comorbidities, vital signs at presentation, investigations, treatment offered in the ED, duration of stay, and disposition of the patients. Disposition of the patients was divided into disposition from the ED and from the hospital. ED disposition was categorized into admission, discharge, left against medical advice (LAMA), refer and mortality in the ED. Hospital disposition was categorized into discharge, LAMA, refer, and mortality in the hospital. The final outcome was categorized into recovery or mortality after follow-up phone calls and EMR review.

Data sources

The search in the EMR system with keywords suicide, attempted suicide, poisoning, hanging, self-harm, self-injury, overdose was conducted and the data was collected in the predesigned form. The identity of the patients was kept confidential. The final outcome was recorded combining the hospital records or phone calls if the case was referred, LAMA, and discharged. The data from the EMR and phone calls were collected in a password secured laptop in the excel sheet.

Statistical methods

Data was analyzed with SPSS version 21. The categorical variables were expressed as frequency/proportion and continuous ones with mean with standard (SD) deviation or median with interquartile range (IQR) as appropriate. Categorical variables were compared with the chi-square test or Fisher-Freeman-Halton Test. The Kruskal-Wallis H test was used to compare the categorical variables (the three periods) with continuous variables as they were asymmetrically distributed. The p-value of less than 0.05 was considered significant. The missing data was excluded from analysis.

Results

Participants

A total of 125 suicide/SH cases presented to the ED during the total study period, 55 during period one, the lockdown period (44%), 38 during period two (30.4%) and, 32 during period three (25.6%) (Fig 1). The total number of patients presenting to the ED in period 1, 2 and 3 were 2085, 3926 and 3769 respectively. This reflects that the total ED visits decreased during the lockdown period when compared to period 2 (by 53%) and period 3 (by 55.4%). The cases of suicide and SH constituted 55 (2.6%), 38 (0.97%), and 32 (0.85%) among the total ED cases

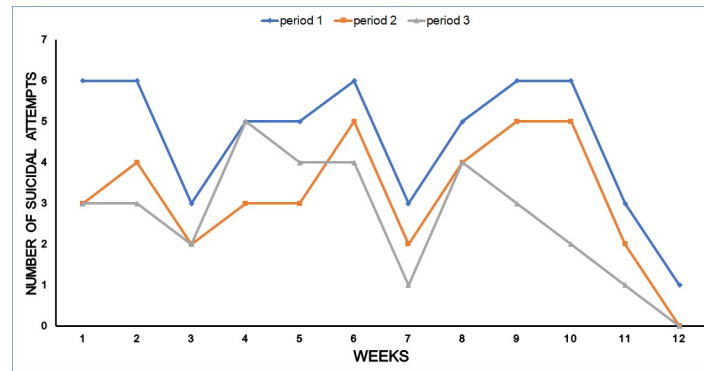


Fig 1. Number of visits to the ED with suicidal attempts throughout the 3 periods analyzed on a weekly basis. Period 1 (blue) (n = 55): the lockdown period (March 24–June 23, 2020), period 2 (orange) (n = 38): matching periods in the previous year (March 24–June 23, 2019) and period 3 (black) (n = 32): 3 months period prior to the state of lockdown (December 24 2019–March 23, 2020).

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during periods 1, 2, and 3 respectively. Comparing the three periods, the cases of SH in the lockdown period increased by 44% (1.45 times) and 71.9% (1.72 times) in relation to period two and three respectively.

Descriptive data

The comparison of different variables in relation to the three periods is depicted in [Table 1](#). The female gender was predominant 75 (60%) [period 1, 34(61.8%), period 2, 24 (63.2%) and period 3, 17 (53.1%)]. The gender difference was not statistically significant during all 3 periods ($p = 0.649$). The age ranged from 12–88 years. The mean age of the patients was 32 (95% CI: 29.3–34.7) {period 1 [29.7, 95% CI: 26.2–33.3], period 2 [35.1, 95% CI: 29.1–41.1], period 3 [32.22, 95% CI: 26.9–37.5]}. However, the difference was not significant ($p = 0.437$). Overall organophosphorus poisoning (OP) poisoning was the most common mode of suicidal attempt [66 (56.4%)], which was similar in all 3 periods [33 (64.7), 22 (61.1) and 11 (36.7) in periods 1, 2 and 3 respectively]. The dose of Atropine used ranged from 2 mg to 1660 mg [Median 57mg, IQR (20–200)]. More details on the mode of suicide and SH are illustrated in [Table 2](#). Multiple drugs or poison was ingested by eight patients (6.4%). Out of 117 cases of poisoning and drug overdose, 44 (37.6%) had induced vomiting at home. Sixteen patients (12.8%) required immediate airway management on arrival. Eight of them (6.4%) had an underlying psychiatric illness. Thirty-one (24.8%) patients were under the influence of alcohol. The underlying reason for the suicidal attempt was not mentioned in the EMR for 53 (42.4%) patients. The alleged causes for suicidal attempts for the rest were disputes with family members, economic crisis, difficulty in coping with studies, disease or death of closed ones in 40(32%), 23 (18.4%), 4 (3.2%), and 5 (4%) cases respectively.

Outcome data

There was a significant delay ($p = 0.045$) in the arrival of the patients in period 1 [200 mins, IQR (125–370) vs 150 mins (120–150) and 180 (112–242) respectively in comparison to period 2 and 3]. There was a significant difference ($p = 0.003$) in patient's disposition from the ED, with an increase in the hospital admission rate and LAMA and a decrease in referrals. Similarly, the overall hospital outcome was also significantly different ($p < 0.001$), with increase in-hospital mortality (18.2% vs 2.6% and 3.1%), and LAMA (18.2% vs 2.6% and 3.1%). Ninety-

Table 1. Different variables in relation to the 3 periods, n = 125.

Variables	Total	Period 1, n = 55	Period 2, n = 38	Period 3, n = 32	p-value (Chi-square unless indicated)
Gender, F, n (%)	75 (60)	34(61.8)	24 (63.2)	17 (53.1)	0.649
Age, mean (95%CI)	32 (29.3–34.7)	29.7 (26.2–33.3)	35.1 (29.1–41.1)	32.22 (26.9–37.5)	0.437 ^a
Median (IQR)	28 (21–40)	26 (21–35)	30 (20–48)	28 (21–43)	
Mode of self-harm					
Poisoning	101 (80.8)	47 (85.5)	33 (86.8)	21 (65.6)	0.072 ^b
Drug overdose	16 (12.8)	4 (7.3)	3 (7.9)	9 (28.1)	
Hanging	8 (6.4)	4 (7.3)	2 (5.3)	2 (6.3)	
Mode of transportation					
Ambulance	74 (59.2)	35 (63.6)	24 (63.2)	15 (46.9)	0.017^b
Hired vehicle	31 (24.8)	17 (30.9)	4 (13.3)	9 (28.1)	
Private vehicle	20 (16)	3 (5.5)	9 (23.7)	8 (25)	
Time elapsed in minutes, median (IQR)	180 (120–340)	200 (125–370)	150 (120–150)	180 (112–242)	0.045^a
Disposition from the ED					
Admitted	47 (37.6)	24 (51.1)	13 (34.2)	10 (31.3)	0.003^b
Discharged	8 (6.4)	5 (9.1)	1(2.6)	2 (6.3)	
LAMA	25 (20)	16 (29.1)	3 (7.9)	6 (18.8)	
Refer	40 (32)	7 (12.7)	20 (52.6)	13 (40.6)	
Mortality	5(4)	3 (5.5)	1 (2.6)	1 (3.1)	
Overall hospital disposition					
Discharge after recovery	45 (36)	20(36.4)	13 (34.2)	12 (37.5)	<0.001^b
LAMA	28 (22.4)	18 (32.7)	4 (10.5)	6 (18.8)	
Mortality	12 (9.6)	10 (18.2)	1 (2.6)	1 (3.1)	
Refer	40 (32)	7 (12.7)	20 (52.6)	13 (40.6)	
Final outcome ^c , death, n (%)	23/99(18.4)	13/46 (28.3)	4/27 (14.8)	6/26 (23.1)	0.440 ^b

Significant P-values are bolded.

^a Independent-samples Kruskal Wallis test

^b Fisher-Freeman-Halton Test

^c those who could not be followed up were excluded, n = 99

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nine cases (79%) responded to a follow-up call which showed no statistical difference (p = 0.440) in the overall mortality in the three periods (28.3%, 14.8%, and 23.1%).

Discussion

Despite a remarkable reduction in overall ED visits, our study showed a disproportionate increase in cases of suicide/SH during the lockdown period in comparison to the matching

Table 2. Types of poison/drug overdose used for suicidal attempts, n = 117.

Type of poison/drug overdose	n	%
Organophosphorus (OP)	66	56.4
Non-OP insecticide/fungicide	8	6.8
Aluminium Phosphide	5	4.3
Zinc Phosphide	3	2.6
Acetaminophen	10	8.5
Others (benzodiazepine, beta blockers, Ibuprofen, Alprazolam and others)	8	6.8
Unknown	11	9.4

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periods in the previous year and prior to the lockdown. OP poisoning was the most common mode of suicidal attempt during all periods. There was a delay in time to arrive at the hospital during the lockdown period with increased in-hospital mortality.

Suicide is a preventable loss that affects families, communities and entire countries. There is some evidence that deaths by suicide increased in Hong Kong during the 2003 SARS epidemic [11]. The WHO has predicted the rise in the number of mental health problems due to the global pandemic and has addressed this issue through various messages and publications related to mental health awareness and prevention [18]. A recent report in China during COVID-19 revealed that about a third of their sample reported moderate to severe anxiety and 53% of the respondents rate the overall psychological impact of the COVID-19 outbreak to be moderate to severe [9]. Strong restrictive measures to avoid COVID-19 infection have led to loneliness, loss of job, and loss of access to health which may precipitate or worsen the existing mental health problem. The lockdown has created a sudden economic recession, unemployment, worsened poverty which might have led individuals to contemplate suicide. Moreover, patients suffering from mental illnesses are unable to access health-care services. The effects might be worse in resource-limited countries like ours, where poor economic status is compounded by inadequate welfare support. Our study shows a considerable rise in the number of suicidal cases since the lockdown period. Various case reports of suicide-related to COVID-19 have been reported worldwide [19]. Studies from our neighboring countries, China [12], India [15], Pakistan [13], and Bangladesh [14] have also raised concerns on increased suicide rate related to COVID-19. In contrast, a study exploring the mental health presentations in the ED before and during the COVID-19 outbreak in developed world showed decreased suicide and SH [20, 21]. Gunnell et al have categorized COVID-19 related suicide risk factors into financial stressors, domestic violence, alcohol consumption, isolation, access to means, and irresponsible media reporting and published a public health response model to mitigate these risks [22]. In our study, the common causes of suicidal attempts during the lockdown period were disputes with the family members and economic crisis. No cases directly related to COVID-19 related illness or death were found.

Suicide is reported as the second leading cause of death among 15-29-year-olds globally [4]. Previous publications had reported higher suicide and SH among women, younger age group, migrant workers, the marginalized and disaster-affected population in Nepal [5]. After the 2003 SARS epidemics the increased suicidal rate among the elderly was reported in Hong Kong [11]. In our study, there was no statistically significant difference in the age of the patients attempting suicide in different periods. The mean age was 32 years and females attempted more suicide/SH in all the three periods. SH includes a variety of behaviors like hanging, self-poisoning, cutting, jumping from heights in response to intolerable mental pressure. OPs are the most commonly used form of pesticide in Nepal [23]. A previous study done at our ED showed that organophosphate poisoning was the commonest form of poisoning [24]. Our study also showed that OP poisoning was the common cause of attempted suicide.

The lockdown, travel restrictions and social distancing likely contributed to a significant reduction in the use of private transport for transfer of patients to the ED. This may have caused the delay in presentation to the ED during the lockdown period in our sample. Our study also shows that the proportion of referrals of suicide/SH cases was less from our hospital during the lockdown period. During the lockdown period, the number of admissions for other illnesses requiring intensive care was low; therefore, more beds were vacant preventing referrals to other centers. This may be the reason for increased overall in-hospital mortality for suicide and SH during the lockdown period or they might have used lethal means to contemplate suicide.

To cope with the effects of the COVID-19 pandemic is emotionally challenging, especially for vulnerable individuals with underlying mental illness, low socio-economic status. Mental

health problems are considered as a social stigma in our part of the world; therefore, people may be reluctant to share their feelings. Stressors like the increasing number of cases and deaths due to COVID-19, prolonged social isolation due to lockdown and social or physical distancing, economic regression and limited access to health care services due to fear of contracting COVID-19 may cause more panic, anxiety, and depression among the general public. The interplay of these factors in turn can precipitate suicide and SH in the future. Therefore, timely interventions to promote and protect the mental health of people and strategies to prevent suicide is of utmost importance [25].

There are several limitations of this study. The study was conducted in one of a rural tertiary care center, which is not representative of the whole country's situation. Therefore, the results cannot be generalized. Moreover, it does not reflect the overall burden of mental health problems in the community and all population groups. An in-depth study of the cases was not done to determine the root cause of the increased suicidal attempts.

Conclusions

We found an increase in the number of patients presenting with suicide and SH in our ED during the pandemic which is likely to reflect an increased prevalence of mental illness in the community. Efforts to prevent the COVID-19 spread should be extended to raise awareness about dealing with mental health issues, recognizing warning signs of suicide and providing support to those needed. All the stakeholders, including policymakers, psychiatrists, psychologists, and other healthcare professionals should collaborate to raise awareness to screen, detect and timely intervene the needy patients. The challenge of the COVID-19 crisis might be an opportunity to advance the suicide prevention efforts in our country and thus to save many precious lives.

Supporting information

S1 File. Data on the cases of suicide and self-harm during the three periods.
(XLSX)

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ED staff of Dhulikhel Hospital- Kathmandu University hospital.

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Supervision: Roshana Shrestha, Anmol Purna Shrestha.

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