

An Evaluation of the Effect of the COVID-19 Pandemic Lockdown on Hanging Cases

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Abstract

Objective: To investigate whether the coronavirus disease-2019 (COVID-19) lockdown influenced the rate of hanging in all age groups. To identify the prognosis, risk factors, and injury patterns of hanging cases. To compare the difference between rates of survival and fatal hanging cases.

Materials and Methods: A retrospective patient review was carried out. This study was conducted in the Emergency Department (ED) of University of Health Sciences Turkey, Bursa Yüksek İhtisas Training and Research Hospital, Bursa, Turkey, between 1 January, 2018 and 30 September, 2022. Survivors and patients who had died were compared in terms of injury patterns and epidemiologic data. Cases admitted to the ED during the COVID-19 lockdown were also documented. A total of 34 hanging cases were reviewed.

Results: This study enrolled 5 men (14.7%) and 29 women (85.3%) with an average age of 33 (32.6-38.4) years. Ten of them died as a consequence of hanging. The findings indicate that the ligature mark most commonly occurs on the anterior side of the neck (n=28, 82.4%).

Conclusion: Additionally, more than half of the patients needed intubation (n=20, 58.8%). Half of the cases that presented on the lockdown days died.

Keywords: Emergency department, forensic sciences, hanging, suicide, the COVID-19 pandemic

Introduction

Every 40 seconds someone dies by suicide. Hanging is one of three common suicide methods worldwide, along with the usage of pesticide poisoning and gunshots [1]. In our country, 1.627 people died by suicidal hanging in 2019. Hanging is the leading suicide method, with a rate of 47.8% among other suicide methods [2]. The term “hanging” refers to an act with the intention of killing oneself by suspension from a ligature point with the usage of a ligature which around the neck [3]. Near-hanging cases are those patients who were unsuccessful in hanging themselves and were brought alive to the hospital [3]. Near-hanging is also a significant cause of morbidity.

The influence of the lockdown and curfew during the coronavirus disease-2019 (COVID-19) period on hanging cases has not been

fully investigated. After the first COVID-19 case emerged in China on 1 December, 2019, the infection began to spread around the world and developed into a pandemic. The pandemic lockdown measures involving the curfews were declared as of 21 March, 2020 in Turkey and worldwide. The pandemic lockdown lasted until 17 May, 2021 in our country. Along with the curfew, individuals under the age of 20 and older than the age of than 65 were completely prohibited from leaving their homes [4].

The goal of this study was to reveal the effects of the COVID-19 pandemic lockdown period and its restrictions on hanging cases in all age groups. It also aims to show the differences in specifications between the surviving and fatal hanging cases. Our goal is to show the epidemiologic data, injury patterns, symptoms, and consequences of hanging cases using regional data.



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Materials and Methods

Our study was approved by the Ethics Committee of the University of Health Sciences Turkey, Bursa Yüksek İhtisas Training and Research Hospital (no: 2011-KAEK-25 2022/10-06). A review was performed of the cohort of 34 patients who suffered from hanging injuries and were admitted to the emergency department of the tertiary hospital in Bursa city in Turkey between 1 January, 2018 and 30 September, 2022. The patient information, including the medical status and epidemiological information, with regard to age, sex, Glasgow Coma scale (GCS), injury patterns, locations of the ligature marks (LMs), and history of chronic disease (CD) or psychiatric disease (PD), was obtained by reviewing the medical records of the patients. Superficial skin lesions were also documented and cross-referenced with specific body parts. Evidence of prior suicides and intubation interventions was also documented.

Statistical Analysis

As statistical analysis, in the data evaluation, frequency tables and percentages, minimum and maximum values and median values were presented. The chi-square and Fisher's exact tests were performed when required. In addition, the Kolmogorov-Smirnov and Shapiro-Wilk normality tests were used for selecting the Student's t-test or Mann-Whitney U analysis. SPSS 15.0 for Windows software package program was used for statistical analysis, and a p value below 0.05 was accepted as statistically significant.

Results

Thirty-four hanging cases were included in our cohort. Ten of them had died as a consequence of hanging. Four of the patients had CD. Five of the cases had a PD; three cases suffered from depression and two of them had post-traumatic stress disorder (PTSD). Of the patients, 29 were women (Table 1), which shows a high female dominance. The median age was found to be 33 years. Three cases presented with radiological findings. Three cases had made a prior suicide attempt. Most of the patients presented with skin lesions (n=28, 82.4%). Two cases sustained cervical vertebrae injury. Six cases did not present with any LMs on their necks. LMs most commonly

occurred on the anterior side of the neck (n=28, 82.4%) (Graph 1). More than half of the patients needed intubation (n=20, 58.8%).

No statistical association was found between the period before and during the curfew of the COVID-19 lockdown period due to the low number of admissions during the curfew. The specifications of the patients are shown in Table 2.

There was no significant association found between fatal cases and survivors, according to the parameters of our study. Nevertheless, survivors tended to be older than those who died (Table 3). One third of the female cases died, while one fifth of the male cases died. Two-thirds of the cases with PD died. Skin lesions were seen in twice as many survivors as in victims of death. None of the patients had bone fractures, ecchymosis, or

Table 1. Epidemiologic data of the cases

Parameter	Numbers
Gender male/female n/(%)	5 (14.7)/29 (85.3)
Age (year)*	33 (32.6-38.4)
Glasgow Coma score	9 (7.6-9.8)
CT or MR finding yes/no	3 (8.8)/21 (61.8)
Chronic disease yes/no	4 (11.8)/30 (88.2)
Psychiatric disease yes/no	5 (14.7)/29 (85.3)
Depression yes/no	3 (8.8)/31 (91.2)
Post traumatic stress disorder yes/no	1 (2.9)/33 (97.1)
Suicide before yes/no	3 (8.8)/31 (91.2)
Skin lesion yes/no	28 (82.4)/6 (17.6)
Abrasion yes/no	28 (82.4)/6 (17.6)
Facial petechiae yes/no	3 (8.8)/31 (91.2)
Cervical vertebral injury yes/no	2 (8.3)/22 (91.7)
Dislocation yes/no	2 (8.3)/22 (91.7)
Ligature mark on the neck yes/no	28 (82.4)/6 (17.6)
Location of the ligature mark on the neck (anterior/lateral/posterior)**	28 (82.4)/12 (35.3)/2 (5.9)
The patients needs for intubation yes/no	20 (58.8)/14 (41.2)

*Continuous data were expressed as median (25-75 percentile), **Some cases have ligature marks on the neck on multiple sides, CT: Computed tomography, MR: Magnetic resonance

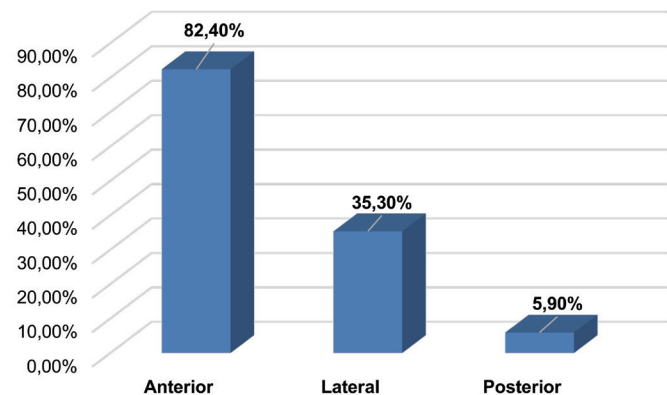
Table 2. The Specifications of the hanging cases during the COVID-19 pandemic

Variables	Case-1	Case-2	Case-3	Case-4
Age	18	31	25	28
Sex	Female	Male	Male	Male
Prognosis	In ward	Reject the treatment	Ex	Ex
GCS	12	15	3	3
Abrasion	Yes	None	Yes	Yes
Location of LM*	Anterior	Posterior	Anterior and lateral	Anterior
Hypoxia	Yes	None	Yes	Yes

*Some cases have ligature marks on the neck on multiple sides, COVID-19: Coronavirus disease-2019, GCS: Glasgow Coma scale, LM: Ligature mark

vessel tears in the cervical structures. Neither did any patients sustain subcutaneous emphysema or cervicospinal damage. None of the cases showed any of the following: Gastrointestinal findings, urinary incontinence, stroke findings, neurological deficits, cough, stridor, dysphagia, headache, or hemoptysis.

During the lockdown curfew, the following patients were admitted: A 26-year-old man who had a PD was admitted. He died as a result of hanging. A 28-year-old man with a diagnosis of depression died as consequence of hanging. A 40-year-old woman who suffered from PTSD was admitted during the curfew days. Although she had many findings, such as a low score on the GCS, aphonia, history of suicide, and loss of consciousness, there was no ligature mark. A 39-year-old man with a CD presented. After the treatment, he was discharged.



Graph 1. Distribution of the cases in terms of locations of the ligature mark on the neck

Discussion

Many studies have reported that most of the hanging cases were of adult age and male [5-9]. In a study exploring ten near-hanging cases, it was found that the mean GCS score was 9.5/15, which was slightly less than our results (11.1/15) [9]. In another study, conducted in the United States of America and consisting of 655 hanging cases, it was stated that the most significant prognostic factor was a GCS score below 15 [5]. Incredibly, it was suggested that any leakage of GCS points increases the mortality rate from 1.5% to 29% [5]. Bordia et al. [10] revealed that a GCS score of 15 excluded brain damage in hanging cases.

Somewhat similar to our results (n=3, 14.7%), Buitendag et al. [6] stated that the prevalence of PD as an illness comorbid with hanging was (n=17; 11.2%) [6]. Although Buitendag et al. [6] reported that 59% of their cohort had abrasions on the neck, our findings indicate higher numbers (n=28, 82.4%). However, in another study, LMs were found in 163 cases (38.4%) [11].

Similar to our results, in a study conducted in Australia exploring 72 near-hanging cases, it was suggested that neither spinal injury nor neurological deficits were found in cases who made a full recovery [7]. Compatible with our findings (n=4, 9%), in the same study, it was reported that the mortality rate of near-hanging cases was n=3, 8.8%. [7]. In studies by Ganesan et al. [8] and Hanna [12] (n=12, 15.6%) and (n=5, 38.4%) respectively of the subjects had made prior suicide attempts.

As in our study (n=28, 82.4%), Sharma et al. [13] revealed that most of the hanging cases (n=53, 80%) had LMs on the neck. In a study including 102 hanging cases, it was revealed that the most of the ligature knots were typically located on the posterior side of the neck (n=54, 52.9%) [14]. While our results

Table 3. The comparison of the cases according to their life status			
Variables	Ex (n=10)	Near-hanging (n=24)	p
Age (year)	30.2±2.5	37.7±3.3	0.167
Gender male/female n/(%)	1 (20.0)/9 (31.0)	4 (80.0)/20 (69.0)	1.0
Glasgow Coma score		11.1±1.0	-
CT or MR finding yes/no	0 (0.0)/0.0	3 (100.0)/21 (100.0)	0.000
Chronic disease yes/no	2 (50.0)/8 (26.7)	2 (50.0)/22 (73.3)	0.564
Psychiatric disease yes/no	3 (60.0)/7 (24.1)	2 (40.0)/22 (75.9)	0.138
Depression yes/no	1 (33.3)/9 (29.0)	2 (66.7)/22 (71.0)	1.000
Post traumatic stress disorder yes/no	0 (0.0)/10 (30.3)	1 (100.0)/23 (69.7)	1.000
Suicide before yes/no	1 (33.3)/9 (29.0)	2 (66.7)/22 (71.0)	1.000
Skin lesion yes/no	10 (35.7)/0 (0.0)	18 (64.3)/6 (100.0)	0.148
Abrasion yes/no	10 (35.7)/0 (0.0)	18 (64.3)/6 (100.0)	0.148
Facial petechiae yes/no	0 (0.0)/10 (29.4)	3 (100.0)/21 (67.7)	0.539
Cervical vertebra injury yes/no	-	2 (100.0)/22 (100.0)	-
Dislocation yes/no	-	2 (100.0)/22 (100.0)	-

CT: Computed tomography, MR: Magnetic resonance

did not look at knot location, the most common location of LMs is found on the anterior. Contrary to our results (n=3, 8.8%); Kurtulus et al. [14] indicated that facial petechiae were observed in 46 (45.1%) subjects. A possible reason for the big difference was that their study was conducted only on dead subjects, whereas our cohort involves both survivors and deaths.

Incompatible with our findings (n=10, 4.1%), in a study that investigated 13 near-hanging cases, it was reported that five patients (38%) needed intubation [12]. In another study involving hanging cases admitted over the course of eight years, it was reported that 28 patients (68.2%) needed intubation [15].

In a study that evaluated suicide attempts during the COVID-19 pandemic, it was stated that a three fold decrease (6% vs. 2%) in hanging admissions was observed during the pandemic [16]. Despite there not being any observed statistical difference before and after the curfew between the number of hanging cases, an upward trend was seen in hanging cases after the lockdown in the UK [17].

Study Limitations

Neither trauma score nor injury severity score was included in our study. Nevertheless, GCS was achieved. Possibly, these scores are recorded in the more accessible patient files. Blood ethanol or drug levels could not be determined. These are the limits of our study.

Conclusion

The COVID-19 pandemic was a significant event that affected the behaviors of individuals. It may have triggered stressful events in all societies. Hanging is one of the most common suicide methods worldwide. In our study, we evaluated the regional data of hanging cases, the trend of hanging cases during the lockdown and the injury patterns of hanging cases were evaluated completely.

Ethics

Ethics Committee Approval: Our study was approved by the Ethics Committee of the University of Health Sciences Turkey, Bursa Yüksek İhtisas Training and Research Hospital (no: 2011-KAEK-25 2022/10-06).

Informed Consent: Retrospective study.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: S.K., A.Z., M.Y., M.Ş., Design: S.K., A.Z., M.Y., Data Collection or Processing: A.Z., M.Y., M.Ş., Analysis or

Interpretation: S.K., M.Y., M.Ş., Literature Search: S.K., M.Y., Writing: S.K., M.Y., M.Ş.

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