

# An Epidemiologic Study of Wednesday Eve Festival “Charshanbe-Soori” in Iran - 2017

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## Abstract

**Background and Purpose:** Wednesday Eve Festival “Charshanbe-Soori” is one of the famous Iranian festivals that is held on the last Wednesday of each Solar Hijri year. The ceremony is accompanied by lighting fires and fireworks. The purpose of this study was the epidemiologic investigation of incidents of Wednesday Eve Festival in 2017. **Materials and Methods:** This ecological study was conducted to evaluate the epidemiological features of the Wednesday Eve Festival in 2017. The research population included all patients referred to all hospitals in Iran on the last Wednesday night of the year. Two-part questionnaire containing demographic information and burns-related factors were used for data collection. To analyze the data, the incidents in different provinces were calculated based on factors such as age, sex, occupation, and education. **Results:** A total of 3285 incidents related to the Persian Wednesday Eve Festival were reported from March 2 to March 15, 2017. The injury rate in 2017 was 4.2/100000. The highest incidence rate was found in Qazvin (15.92) and Kurdistan (13.7) cities, and the lowest incidence rate was reported in Kerman (0.13) Sistan and Balochestan and Yazd (0.23)/100,000. **Conclusion:** Fireworks in Wednesday Eve Festival have become serious trouble, not only because nowadays principles and its traditional aspects are ignored but also it inflicts considerable harm and damage on families and our country by using destructive incendiary equipment. To prevent upcoming incidents, educating the community, especially the youth and teenagers, are necessary.

**Keywords:** Burn, epidemiology, injuries, Persian Wednesday Eve Festival

## INTRODUCTION

Festivals and celebrations are held in all countries, and people make fire in these ceremonies for fun and entertainment. Examples of these festivals are New Year’s celebrations, Halloween (October 30), and July 4 (United States Independence Day).<sup>[1,2]</sup>

The New Year in China<sup>[1]</sup> and Guy Fawkes in England, Diwali in India, (5) Hari Raya Festival in Malaysia,<sup>[3]</sup> Tihar in Nepal, Bastille Day in France (7) are other examples of such annual celebrations. Wednesday Eve Festival is also one of the oldest Iranian traditions which in the past were held by lighting small fires and jumping over them usually at sunset and at predetermined places like squares. The ultimate goal of this

ceremony has been cleaning the environment and eliminating the annoyances between people and entering the New Year with a clean mind and heart. Wednesday Eve festival is a celebration that marks the beginning of the New Year. Its history in Iran dates back to 1725 B. C.<sup>[4]</sup> Unfortunately, today, many years, after the origin of the event, its traditional form has been changed and it has become dangerous because of

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using explosives.<sup>[5]</sup> Only in 2013, about 11,400 casualties were hospitalized due to July 4 fire-related incidents in the United States.<sup>[6]</sup> Many of the events occurring in the Middle East cause irreparable damage, such as amputation and blindness. It imposes a lot of cost on the family and society.<sup>[7]</sup> Considering the importance of the problem and the possibility of preventing such incidents, the program for preventing injuries caused by the fireworks got on the agenda by “Safe Community Committees” of all medical universities throughout the country. The aim of this study was to investigate the epidemiological characteristics of the casualties in this ceremony so that these results can be used by officials to prevent further such tragic events during “Wednesday Eve Festival.”

## MATERIALS AND METHODS

This ecological study was carried out on all victims of the 2017 Wednesday Eve festival, ceremony who were referred to hospitals across the country. Information from this study was collected and recorded routinely through interdepartmental programs of health centers and hospitals affiliated with medical universities. Universities affiliated with the Ministry of Health are required to routinely send Charshanbe-Soori accident data to the Noncommunicable Disease Unit of the Ministry of Health.<sup>[8]</sup> The population included all patients who hurt in the Wednesday Eve Festival and referred to health centers. The data collection tool was a two-part checklist containing demographic information and incident-related factors. This information includes age, gender, occupation, education, marital status, cause of the incident, incident location, type of injurious devices, injured organ, percentage of injury, and the result of the incident. The population information in 2016 was extracted from the website of the statistical center of Iran (<https://www.amar.org.ir>) and population of 2017 from the total population and all of the subgroups from the information of 2016 were estimated.

The incidence rate of injury was calculated regarding the provinces of the country, age, sex, education, and occupation.

## RESULTS

On March 15–24, 2017, 3285 people were injured by explosives. In 2016, the incidence of injury was calculated 3.2, and in 2017, it was estimated to be 4.2/100,000 people. The highest incidence rate was observed in Qazvin (15.92), Kurdistan and West Azarbaijan (13.65), and Tehran (10.35)/100,000 people. The lowest incidence rate was reported in a Kerman province (0.19), Sistan and Balochestan and Yazd (0.23), Khuzestan and Fars (0.8)/100,000. In 2016, the highest incidence was in West Azarbaijan Province by 9.48% per 100,000. Furthermore, the incidence rate in all provinces was lower than that in 2017 [Table 1]. The frequency of injury in men was 2645 (80.5%) and in women 640 (19.5%)/100,000. Furthermore, the incidence rates of injury in men and women were 6.53 and 1.62/100,000, respectively.

The highest incidence was observed in the age group of 5–19 years, with 7.72 and the lowest in the age group

**Table 1: Frequency and incidence of Wednesday Eve Festival Charshanbe-Soori in different provinces of the country per population**

Province	2016		2017	
	Count	Incidence	Count	Incidence
Gazvin	66	5.34	119	15.92
Kordestan	109	7.16	177	13.65
West Azarbayejan	303	9.48	354	13.65
Tehran	721	5.75	1283	10.35
Zanjan	78	7.64	57	7.51
Markazi	103	7.06	89	7.39
Hamedan	78	4.32	69	7.05
Gilan	45	1.81	152	6.6
Ardebil	90	7.06	20	6.14
Alborz	162	6.35	126	5.35
East Azarbayejan	1 83	4.84	119	5.35
Kermanshah	87	4.44	96	4.78
Isfahan	116	2.22	140	3.41
KhorasanNorth	14	1.61	15	3.13
Semnan	14	2.12	13	2.5
Mazandaran	65	2.02	56	2.39
Boshehr	14	1.31	23	2.05
South khorasan	10	1.31	14	2.05
Razavikhorasan	150	2.42	40	1.71
Loresatn	34	1.92	16	1.59
Khozestan	48	1.01	34	0.8
Fars	4	0.1	27	0.8
Golestan	14	0.81	13	0.68
Sistan and Balochestan	0	0	16	0.23
Yazd	0	0	13	0.23
Kerman	2	0.1	18	0.11
Ilam	0	0	12	2.1
Charmahal and Bakhtiari	0	0	37	2.3
Qom	0	0	50	6.3
Kohkiloie	0	0	29	2
Hormozgan	0	0	67	4.2
Total	2502	3.2	3285	4.2

of >60 with 0.9/100,000. Regarding the patients’ place of residence, 89.8% lived in urban areas, 6.5% in rural, and the remaining (3.7%) had marginalized life. The incidence rates of injury in urban areas and in the margin of the cities were 5.19 and 5.1/100,000, respectively. In terms of occupation, the highest incidence was 10.7 in students and the lowest was in homemakers with 1.47/100,000. Interestingly, regarding the level of education, the highest incidence was observed in those with a university degree and the lowest in the second stage of general education with 36.3 and 2.72/100,000, respectively [Table 2]. The most commonly affected body regions injured were the upper extremities (42%), followed by the eyes (20%) and lower extremities (8%). As a result of the accident, the majority of casualties was treated on an outpatient basis (2864 cases), 379 were hospitalized, 16 died and 26 were experienced disability. The most common type of injury was cutting-wound, accounting for 51% of the patients,

followed by burn [Table 3]. Among those died, seven cases during the use of explosives, 6 cases during making it, and 3 passers by who did not attend the ceremony were killed.

**Table 2: Frequency and incidence of events according to demographic variables in 2017**

Variable	n (%)	Incidence (×10 <sup>5</sup> )
Sex		
Male	2645 (80.5)	6.53
Female	640 (19.5)	1.62
Age (years)		
5>	140 (4.3)	1.97
5-19	1355 (41.2)	7.72
20-29	858 (26.2)	5.88
30-59	865 (26.2)	2.6
60+	67 (2)	0.9
Incident area		
City margin	123 (3.7)	5.1
Rural	214 (6.5)	1.03
Urban	2948 (89.8)	5.19
Education level		
Illiterate	271 (8.2)	3.08
Secondary school	1597 (48.5)	2.72
College	1417 (43)	36.3
Occupation		
Student	1309 (39.8)	10.7
Housewife	303 (9.2)	1.47
Employed	164 (4.9)	5.5
Child	194 (5.9)	2.28
Other	232 (7)	6.3

**Table 3: Frequency of Wednesday Eve Festival Charshanbe-Soori by type, outcomes of incidents and damage type**

Variable	n	Percentage
Injured member		
Hand	1370	42
Eye	654	20
Foot	295	8
Face	270	3
Head	86	1
Ear	38	3
Hand and eye	85	1
Hand and foot	33	1
Chest, abdominal, shoulder	85	3
Other	369	11
Result		
Hospitalization	379	12
Outpatient	2864	87
Death	16	<1
Disability	26	<1
Type of injury		
Wound- cutting	1669	51
Burn	1611	49
Strike	5	<1

Among all deaths, 9 cases (56.3%) and among all injuries, 21 cases (80.8%) were related to Tehran Province. While in the age group of 0–5 years and 5–19 years, >50% of the injuries were related to burns, in the age group of 20 years and older the most frequent injury was related to cuts and wounds and the incident rate was increased upward with increasing the age.

Most of the patients who were treated on an outpatient basis belonged to the age group of 0–5 years (92.1%). Moreover, the highest number of deaths was observed in the age group of 20–29 years (seven cases) and the highest number of disabilities was seen in the age group of 5–19 years (nine cases) [Table 4]. Most of those hospitalized had burn injuries (61%). In general, 2864 patients (87.2%) were treated on an outpatient basis, 379 (11.5%) hospitalized, 16 cases were killed, and 26 cases experienced disability. The use of firecrackers was responsible for 48% of all injuries and 58.8% of the injured had provided incendiary materials from peddlers.

## DISCUSSION

Burn is an irreversible but preventable event that is one of the main causes of disability and mortality in the world. It is responsible for 5%–12% of all traumas in the world and causes many physical, psychological, social, and economic complications.<sup>[9-11]</sup> Epidemiologic studies are carried out in various burn centers in Iran and other countries to show that this incident constitutes a high percentage of incidents and causes mortality, disability, pain, physical, mental, and economic problems.<sup>[12,13]</sup> In this study, the incidence rates of events on the Wednesday Eve Festival “Charshanbe-Soori” in 2016 and 2017 were 3.2 and 4.2 in per 100,000, respectively. The most frequent incident occurred in Qazvin with 15.9/100,000. The incidence of injury in men was 6.53 and in women was 1.62/100000. Furthermore, most injuries were reported in the age group of 5–19 years. The average age of victims in such festivals in Northern Ireland<sup>[14]</sup> was reported 8.9 years and in India<sup>[15]</sup> and Australia<sup>[16]</sup> 11.6 years. In the current study, the greatest damage was related to cuts and wounds (50.8%), followed by burns (49%). Moreover, 87.2% of the injured were managed on an outpatient basis, 11.5% were hospitalized, 16 were killed, and 26 were disabled. Using of fireworks is a common event in national festivals in many countries. A 10-year study by Puri *et al.* in India, which was performed on 157 injured people at the Diwali Festival, showed that most of them belonged to the age group of 5–15 years (35%) and the most common cause of injury was the incorrect use of fireworks (41%). In general, during 10 years, 157 people (an average of 15.7 people per year) were injured in this festival.<sup>[17]</sup> In another study by Isa and Moe in Malaysia on 38 victims who were involved in the fireworks at the Hari Raya, he found that 68.5% of casualties were belonged to 10–19 years old group and cause of injury in 36.8% of cases were hand-made devices. Moreover, 63.2% of the victims had finger amputations. Most of the injuries were related to the hands (73.7%), followed by eyes (36.8%).<sup>[3]</sup> In another study by Zohar *et al.* who were investigated all injuries due to the firework ceremony of Eid Ghorban during

**Table 4: Frequency of injuries of Wednesday Eve festival based on age groups, the result of injury, and the type of injury**

Age group	0-5, n (%)	5-19, n (%)	20-29, n (%)	30-59, n (%)	60+, n (%)	Total, n (%)
Wound-cut	62 (44.3)	602 (44.5)	445 (51.9)	518 (59.8)	42 (62.6)	1669 (50.8)
Burn	78 (55.8)	750 (55.5)	411 (48.1)	347 (40.2)	25 (37.4)	1611 (49)
Strike	0	3 (0)	2 (0)	0	0	5 (0.2)
Hospitalization	8 (5.7)	138 (10)	138 (16)	85 (10)	10 (15)	379 (11.5)
Outpatient	129 (92.1)	1202 (89)	707 (82)	769 (89)	57 (85)	2864 (87.2)
Death	0	6 (0)	7 (1)	3 (0)	0	16 (0.5)
Disability	3 (2.1)	9 (1)	6 (1)	8 (1)	0	26 (0.8)
Total	140	1355	858	865	67	3285

1999–2003, the majority of firework injuries were happened in children under the age of 15 (53%), and 58% of the injuries were related to the extremities, 24% to eyes and face and 11% burns.<sup>[18]</sup> The study conducted by Vaghardoost *et al.* on victims who were referred to Shahid Motehari Hospital in Tehran from 2000 to 2011 because of participating Wednesday Eve Festival, showed that the mean (standard deviation) age of casualties was 9.31 (18.3), 87% were men, 56% had hand injuries and 62.2% were users and 14.6% were producers of fireworks. Regarding the thickness of burn, 59.8% had second- and 20.7% had third-degree burns.<sup>[19]</sup> The results of the present study are consistent with the above-mentioned studies in this field regarding demographic distribution, type, and the severity of the injury mainly due to the use of these devices by adolescents. Similar results were reported in another study in Tehran.<sup>[7]</sup> Most of the studies that have been done in this field have been merely descriptive, and none of them have provided incidence. Although most studies show an increase in incidents of national festivals' injuries in Iran, some studies show a decreased incidence.<sup>[3,5]</sup> However, unlike the other studies, a few accidents have been reported in homes.<sup>[20]</sup> In the present study, limb injury was one of the most common injuries. It seems that the poor quality of the incendiary materials and their untimely explosion or individual mistakes is responsible for such incidents. In Puri *et al.*'s<sup>[17]</sup> study, hands were the most common site of injury. Keeping the device in the hands was the main cause of the damage.<sup>[17]</sup> In similar studies that have been conducted in Ireland, the UK, Australia, and Denmark, hand injury was the most common type of injury.<sup>[16,21]</sup> In another study in Saudi Arabia, hands were the most commonly damaged organ. Most of these injuries were due to burns, tendon ruptures, nerve damages, fractures, and dislocations.<sup>[22]</sup> Other studies have also reported hand injuries as one of the most affected organs in such events.<sup>[14,23]</sup> Many previous studies have been made around the world on events caused during popular festivals; none of them fully focused on some epidemiological features such as age, sex, and occupation. Likely in most festivals, fireworks are used in special places by experienced and professional persons and other people are generally just watching it, while in Iran, fireworks are mostly played by the people themselves, especially teenagers. In many cases, these devices are not safe enough, and sometimes, they cause damage during the production process.

## CONCLUSION

The results showed that men are more likely to be harmed than women, and the age group of 5–19 years had the highest risk of injury. A retrospective study by using accurate data in the past 5 years to indicate more detailed information on the firework effects on Wednesday Eve Festival is recommended.

## Recommendation

Considering that teens are the more vulnerable group to firework injuries, necessary training for this age group in schools is recommended. Using and supplying standard firework equipment and preventing the nonstandard device production may decrease the damages caused by this traditional event.

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## Conflicts of interest

There are no conflicts of interest.

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