

# Evaluation of Burn Injuries and Epidemiological Factors in Patients Hospitalized in Shohada Mehrab Hospital in Yazd-Iran 2019

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## ABSTRACT

**Introduction:** Burn injuries are among the most important causes of disability and medical problems in the world. Weakness and inability of the burn is greater than the pain of the burn.

**Methods:** This is a cross-sectional study-analysis in which the case of 126 patients admitted to the Shohada Mehrab Hospital, affiliated to the Shahid Sadoughi University of Medical Sciences in Yazd during the first six months of 2019, has been reviewed.

Data were collected in a checklist designed by the researcher, and demographic variables and using the chi-square test, mean comparison, and using descriptive and analytical statistics and linear regression in the SPSS V.24 software was analyzed ( $p > 0.05$ ).

**Results:** The findings of this study stated that 73.8% (93 people) of patients were male and 26.2% (33 people) were female. 67.5% (85 people) were burned with thermal flames ( $p > 0.019$ ) and 13.5% (17 people) with boiling water ( $p > 0.44$ ). 77% (97 people) of home accidents, 22% (28 people) occurred at work, and 1% at other places (farm, car, etc.). 47% of these patients were 20% and 23% between 21-40 percent burns, 18% between 41-60 percent burns and burns 8% between 61-80 percent and 4 percent are between 81-100 percent burned. This study results showed that the main cause of burns is fire (67.5%).

**Conclusion:** The results of this study showed that most burns are among men, and about 70% of deaths are among men. The average length of hospital stay was 12 days, 22 patients died, and the fatality rate was 17.5%. This study showed that 67.5 % of burns were of the thermal type and hot water and hot liquids were the next cause of burns (13.5 %). Effective factors are fatality, patient age, and total body surface area (TBSA).

77% of burns occurred at home, 22% at work, and 1% at other places (farm, car, etc.). High incidence of burns and the loss of active community force will result in cost and disability. Treatment of burns requires a long hospital stay, which in addition to the high cost, can cause mental and psychological injuries to the patient.

**Keywords:** Burn, Epidemiology, Flame, Patient burn, Yazd

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## Introduction

Burns are one of the most common forms of trauma in the world. Therefore, in order to reduce mortality and burn complications, these patients urgently need intensive care (1). Burns and injuries caused by overheating, causing immune deficiency patients, and patients with infectious complications are followed (2). Accordingly, patients with a burn injury cannot be considered recovered when the wounds have healed; Treatment of injuries and burns complications is long and deep. These side effects affect the quality and lifestyle of patients. Burn care providers face many challenges. Some of these challenges include managing acute and sensitive care, remission, beauty, treatment costs, and long-term care (3). Burns cause many economic and social problems in society. 96% of fatal fire-related burns occur in low- and middle-income countries. In many of these countries, in addition to the large number of deaths, the lifelong disability, deformity, and mental health of millions of people are the consequences of these events (4).

Burns and scalds are common presentations to many of our health institutions. Most of these injuries are preventable. However, many of the patients end with severe morbidity or even death (5). Iran mortality is very high in burns. On average, between 24,000 and 28,000 people are hospitalized each year due to burn injuries and accidents. This number is much higher in outpatients. According to these statistics, problems such as non-standard hospitals, lack of budget for burn prevention, lack of workforce, and lack of hospital beds cause most treatments to be incomplete and undesirable and, as a result, in some cases, cause the death of patients (6). A study conducted in eastern Iran has reached significant results. About 71% of burns were caused by fire, 21.2% by boiling water, and 8% by other causes. The patients' age was between 10 and 80 years, and 58.6% of patients were female, and 41.4% were male (7). Other studies in the South-east of Iran, among the patients, 55.4% were male, and 44.6% were female. The average

age was 20.94 years. The mean size of the burn area was 34% total body surface area (TBSA). Total body surface area burn was significantly higher in those with suicide ( $p=0.0001$ ). Most of the burns were among children under 15 years of hot liquids (44%). In children younger than 15 years, scalds (hot liquid) were the most frequent cause of burn (44%). There was a higher incidence of suicide in women ( $p = 0.0001$ ), and the mean length of hospital stay was 12 days. In this study, the age group of 16 to 20 years had the most burns. High-risk groups are children and adults, and mortality was higher in these groups. Comprehensive programs are needed to prevent burns in these groups (8).

Shohada Mehrab Hospital is the only specialized burn hospital in Yazd province, and increasing its quality of services is one of its goals. The present study aimed to evaluate burn and epidemiological factors in patients hospitalized in Shohada Mehrab Hospital for six months in 2019. The aim of this study was to evaluate the epidemiological characteristics of burn patients and evaluate the relationship between different variables with burns.

## Methods

This is an analytical cross-sectional study that examined 126 patients first six months of 2019 who were selected by the census, and this study was conducted at the Shohada Mehrab Hospital of Shahid Sadoughi University of Medical Sciences in Yazd.

The files of hospitalized patients were reviewed after permission from the archive unit. The initial information form included the factors related to the burn (burn agent, type of burn and cause of the burn, burn areas) and the eventual outcome of the burn. The questionnaire was completed experimentally (15 items) to confirm its' reliability, and after two weeks, all checklists were distributed. The answers were not significantly different. Using various sources and the approval of experts on this subject, the validity of the

questionnaire was confirmed. The Reliability Analysis was 0.75 which was very reliable.

Demographics also included age, sex, place of residence, occupation, and nationality. Data obtained from patients' medical records at six months were analyzed. During the implementation and analysis of the data, only the patients' file numbers were reported, and the names of the patients were not mentioned. Therefore, ethical considerations were observed. Demographic variables and burn information were analyzed using the chi-square test, mean comparison one-way ANOVA, and linear regression using SPSS v.24 at a significant level of 0.05.

## Results

Demographic variables showed that 73.8% (93 patients) were male and 26.2% (33 patients) were female. The mean age of patients was 28 years (standard deviation 10.77), 50 patients (39.7%) under 20 years old and 44 patients (34.9%) between 21 and 40 years old, 23 patients (18.3%) from 41 to 60 years old. They were. 7.2% were between 61 and 80 years old. The mortality rate was 17.5%, the highest mortality was in the age group of 41 to 60 years. 74.6% (94 patients) were less than 40 years old. (Table 1)

**Table 1.** Patient demographic information

Age Group(year)	N	percent	Fatality rate
<20	50	39.7%	22.72%
21-40	44	34.9%	18.2%
41-60	23	18.3%	40.9%
61-80	9	7.2%	18.18%

Effective factors were fatality patient age ( $p > 0.012$ ), and total body surface area (TBSA) ( $p > 0.05$ ). The main cause of burns was flame burns.

About 67.5 % of burns were of the thermal type, and hot water and hot liquids were the next cause of burns (13.5 %). 6.3% of burns were electric

burns. (Table 2)

77% of burns occurred at home, 22% at work, and 1% at other places (farm, car, etc.). 67.5% of patients were intra-provincial, and 32.5% referred to the hospital outside the province. The highest fatality was caused by the flame (77.27%).

**Table 2.** Distribution of burn type and death rate among patients

		Frequency	Fatality	P
sex	Male	93(73.8%)	15(68.8%)	0.86
	Female	33(26.2%)	7(31.2%)	
Flame	Male	62(72.95%)	12(70.5%)	>0.019
	Female	23(27.5%)	5(29.5%)	
Boiled water or hot liquids	Male	13(76.5%)	1(100%)	>0.44
	Female	4(23.5%)	0	
Electric burns	Male	8(100%)	1(100%)	>0.48
	Female	0	0	
Chemical burns	Male	0	0	>0.001
	Female	1(100%)	0	
suicide	Male	1(100%)	1(50%)	>0.001
	Female	1(100%)	1(50%)	
Other factors (sun, lightning)	Male	9(69.25%)	1(100%)	>0.001
	Female	4(30.75%)	0	

## Discussion

There have been many burns reports, and research has shown that burns are a major cause of morbidity, mortality, and disability. Rates varied between the sexes; among children under 15 years of age, most patients were male, but the opposite applied to all groups >15 years of age. Leading death causes were burns, falls, and poisoning among 628 people who died because of home-related injuries (7, 9). There are many variables on the rate, causes of death of patients, which can be based on the incidence, sex distribution, TBSA, and cause of injury reported in previous studies. Single males aged 20-39 years and young married women aged 15-29 years were at the greatest risk of suicidal behavior by burns. The most common precipitating factor (74.4%) for suicidal behavior was a quarrel with a family member, a relative, or a friend (10). 73.8% (93 people) of patients were male and 26.2% (33 people) were female. 67.5% (85 people) were burned with thermal flames, and 13.5% (17 people) with boiling water. 77% (97 people) of home accidents, 22% (28 people) occurred at work, and 1% at other places (farm, car, etc.). The maximum death rate occurred in 40-60 years of age. About 17.5% of the patients with burn injuries died. The cause of death of the burn ward patients in cities is the delay in referral due to distance and the loss of early hours of care that plays an important role.

The average age of burn patients was 28 years, which was consistent with previous research (3, 7, 11). The greater number of burns in men than in women was probably due to men's greater activity; It is also often associated with the type of occupation of men. Therefore, it is necessary to study the environmental and cultural factors according to the observed concordances.

one studies were included in the review, from 12 countries. Burn injuries were found to be one of the leading causes of injury morbidity and mortality. The reported incidence of burns ranged from 112 to 518 per 100,000 per year. Burn victims were more frequently young, and approximately one-third of the victims were children aged 0-5 years. Hospital mortality ranged from 5 to 37% but was commonly above 20% (12).

In another study, the overall mortality rate was 8.7%; 65.7% of patients were men, and 34.3% were women. The mean age of patients was  $31.47 \pm 22.67$  years. Mean Total Burn Surface Area (TBSA) was  $15.24 \pm 18.4$ . The lowest TBSA was 0.5%, and the highest TBSA was 100%. Significant associations were observed between age ( $p = 0.0001$ ), place of residence ( $p = 0.004$ ), level of education ( $p = 0.0001$ ), unemployment ( $p = 0.0001$ ), marital status ( $p = 0.021$ ), causes of burn ( $p = 0.0001$ ), TBSA ( $p = 0.0001$ ) and mortality rate (13).

In the study by Maghsoudi et al., these results were reached. Most burns were in the age group of 1-9 years (29.2%), and 79.8% of patients had less than 40% burns (14). Another study found that patients' average age is 32.5 years and the average burn is 11.5% (TBSA). The most common cause of burns is flame burning (45.6%) (15). An article states that adults are more prone to burns. Children are mostly burned with hot liquids and adults with explosions of fire and gas (16). In a study conducted in Iran, the average length of hospital stay was 8 days with a range of 1 to 43 days (17). In this study, adolescents and adults (10 to 40 years old) accounted for 44.3% of patients, and children under 10 accounted for 46.3% of patients (18).

### Conclusion

High incidence of burns in men and the productive age range in addition to the loss of active community force will result in cost and disability. Treatment of burns requires a long hospital stay, which in addition to the high costs, can cause mental and psychological injuries to the patient. Increasing accidents at home and caused by gas appliances, periodic visits to home gas systems are increasingly felt. Preventive measures and appropriate training through nurses, physicians, mass media, health centers, and health homes and offices, schools, and municipalities should be a priority.

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The code of ethics of this research is IR.SSU.SPH.REC.1399.18020.

#### Author contribution

M.Heydaripur interpreted the data. MM. Bahri helped to collect the data.

E.SHeykhi participated in the planning and writing and contributed to the statistical analysis.

M.Heydaripur was the lead editor of the project and contributed to the writing.

All authors read and approved the final manuscript.

#### Conflict of interest

The authors declare no conflict of interest.

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