

# The Relationship between Environmental, Cultural and Chronological Factors with the Frequency, Cause and Type of Burn Injuries Admitted to the Trauma and Burn Center Motahari Hospital, during the Years 2007 to 2011

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## ABSTRACT

**Background:** One of the most important health associated problem are events, which burns considered the most common of them. To prevent burn and reduce the complication and mortality rate, accurate information of epidemiology of burn is essential for planning properly. This study was conducted to determine the relationship between environmental and cultural factors and the type, cause and extent of burn injuries admitted to the trauma and burn center of Motahari hospital during 1386 to 1390.

**Methods:** In this routine data base study, we recruited all burned patients which referred to trauma and burn center of Shahid Motahari hospital between 2007 and 2011. Main variables including economic conditions, season of occurrence of the accident, the accident to carried on special occasions, year of accident, accident status on holidays, type of injury, cause of injury, injury severity, burn area, and demographic variables such as age and gender were entered in checklist from patient's documents. Collected data were entered into software SPSS version 11 and were analyzed.

**Results:** 5511 patients were admitted to Motahari hospital during the April of 1386 to the end of 1390, from which 1448 (26.3%) cases were female and 4063 (73.7%) male. The mean age of subjects was 28.47 (SD=1.88). There was significant difference between different gender and etiology, so that men were burned more by oil, gasoline and diesel fuel rather than women. There was significant difference about the number of burned cases by the flame at different seasons of the year. Average number of people burned by gas cylinders, electricity, car accident, bitumen was significantly different in different seasons.

**Conclusion:** There were significant differences about burn injuries due to the gas cylinders, bitumen, electricity and car accidents in different seasons and months. To inform burn centers, principal ship of these data increases their ability to manage populated and harmful days. According to the higher rate of explosive burn injury in the last month of the year producing harmless explosive materials can be so effective to support patients lives.

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► *Implication for health policy/practice/research/medical education:* The Relationship between Environmental, Cultural and Chronological Factors with the Frequency, Cause and Type of Burn Injuries

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### **1. Introduction:**

Abnormalities in thyroid hormone One of the most important health associated problem are events, which burns considered the most common of them due to severe complications and high mortality rate (1). This event constitutes 5-12% of all traumas around the world and the 5th cause of death in the U.S (2). Annually 1.25 million people have suffered from burns that require medical attention (3). The victims not only suffer physically from burn injuries, treatment and rehabilitation, they also suffer psychologically (4).

To prevent burn and reduce the complication and mortality rate, accurate information of epidemiology of burn is essential for planning properly. One of the most important criteria in assessing the effectiveness of service provided to burned patient is knowing the information of annually mortality rate and also this information would be needed to allocate financial and human resources and efforts in order to provide better condition (5).

The knowledge of this information can be helpful in determining prognosis and appropriate strategies to prevent unintended consequences and to reduce cost and equipped burn centers, and returning to work as soon as possible for

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victims.

This study was conducted to determine the relationship between environmental and cultural factors with the type, cause and extent of burn injuries admitted to the trauma and burn center of Motahari hospital during 1386 to 1390.

### **2. Materials and Methods:**

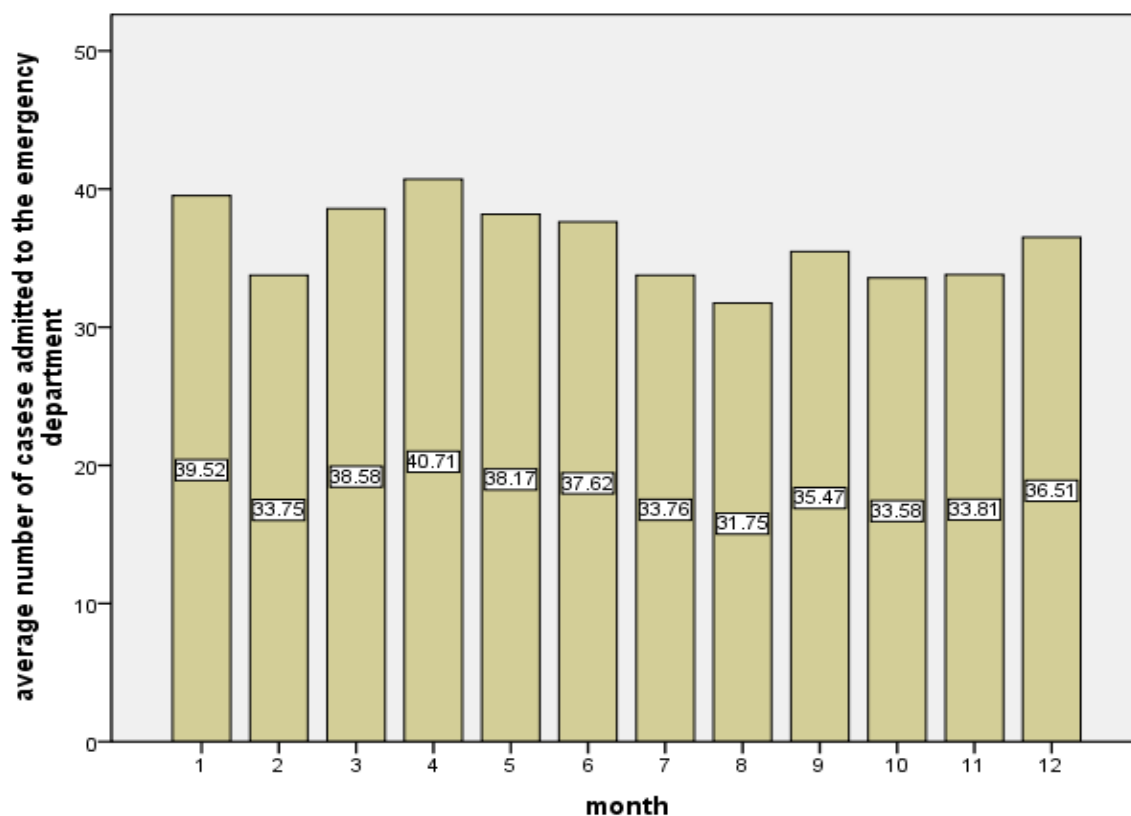
This cohort study was conducted in burning center of Shahid Motahari hospital in Tehran from 2007-2011. We recruited all injured patients which referred to trauma and burn center of Shahid Motahari hospital. Written consent was obtained from all patients to enter the study.

Main variables including economic conditions, season of occurrence of the accident, the accident occurred on special occasions, year of accident, accident status on holidays, type of injury, cause of injury, injury severity, burn area, and demographic variables such as age and gender were entered in checklist from patient's documents.

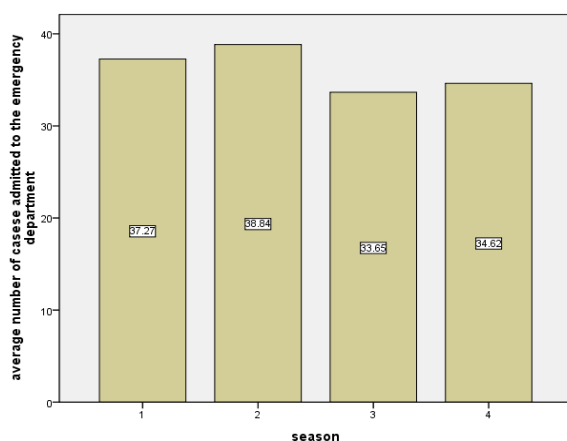
Collected data were entered into software SPSS version 11. Descriptive statistics were used to determine the frequency and one way ANOVA, Student T test and Correlation test were used to analytical statistics.

### **3. Results:**

5511 patients were admitted to Motahari hospital during the April of 1386 to the end of 1390, from which 1448 (26.3%) cases were female and 4063 (73.7%) male.



**Fig. 1. Number of burned cases admitted to the urgency of the burn center in different months of the year**



**Fig. 2. Number of burned cases admitted to the urgency of the burn center in different seasons of the year**

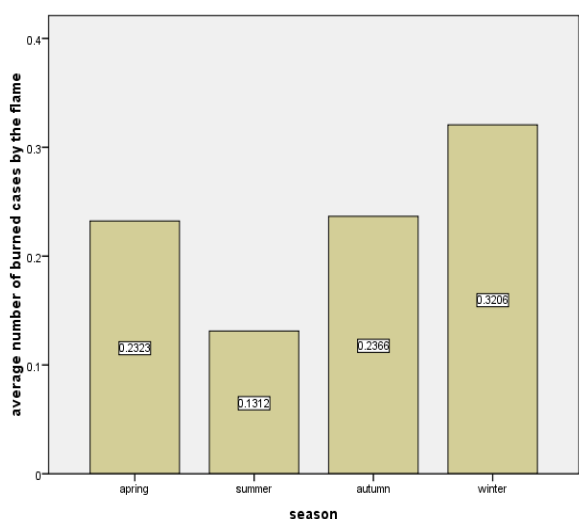
The mean age of subjects was 28.47 (SD=1.88) and the mean age in women were respectively 28.8 (SD=2.1.7) and in men were 28.57 (SD=1.7.6).

There was significant difference between different gender and etiology, so that men were burned more by oil, gasoline and diesel fuel rather than women (6.7% in women vs. 17.7% in men, P value<0.001).

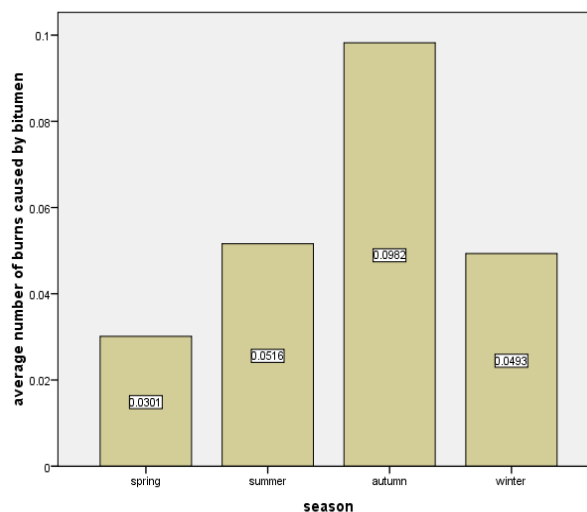
There was significant differences about the number of burned cases admitted to the urgency of the burn center in different months of the year, the highest average was in July and the lowest in November (P value=0.05) (Fig. 1).

There was significant differences about the number of burned cases admitted to the urgency of the burn center in different seasons of the year, the highest average was in summer and the lowest in autumn (P value=0.014) (Fig. 2).

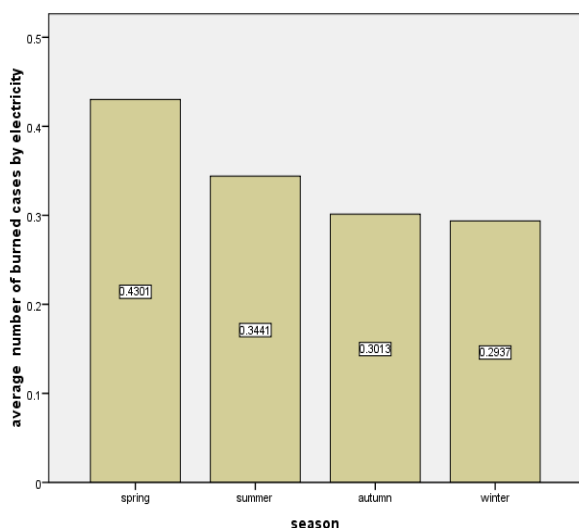
There was significant difference about the number of burned cases by the flame at different seasons of the year (P value<0.001). So that the highest average was in winter and the lowest average was in summer (Fig. 3), and also there was significant difference in average number of people burned by electricity in different seasons (P value=0.003), so that the highest average was in spring and the lowest was in winter (Fig. 4). The mean number of burns caused by bitumen was



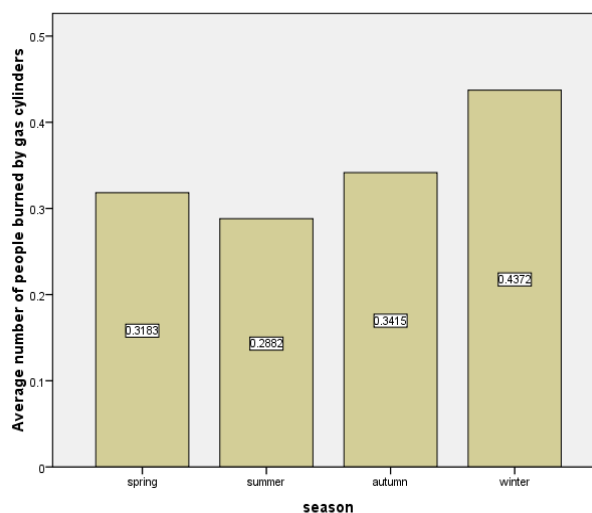
**Fig. 3. Number of burned cases by the flame at different seasons of the year**



**Fig. 5. The mean number of burns caused by bitumen**



**Fig. 4. Number of people burned by electricity in different seasons**



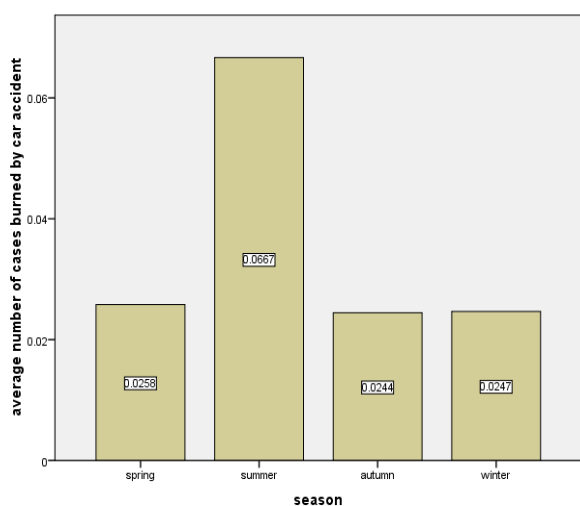
**Fig. 6. Number of people burned by gas cylinders**

significantly different in different seasons ( $P$  value=0.001), so that the highest average was in autumn and the lowest was in spring (Fig. 5).

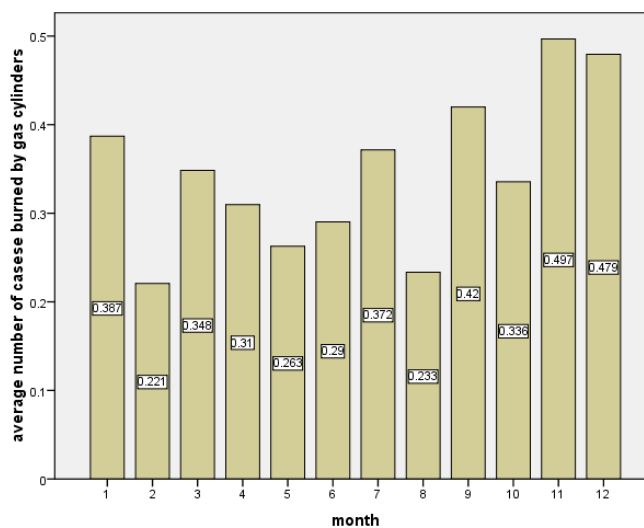
Average number of people burned by gas cylinders was significantly different in different seasons. Highest average was in winter and the lowest average observed in summer ( $P$  value=0.013) (Fig. 6). also there was significant different about the average number of people burned by car accident ( $P$  value= 0.002), so that the highest average was observed in the summer (Fig. 7), and also there was

significant difference in average number of people burned by electricity in different months, so that the highest average was in June then in April and the lowest was in March then in December ( $P$  value=0.045) (Fig. 8).

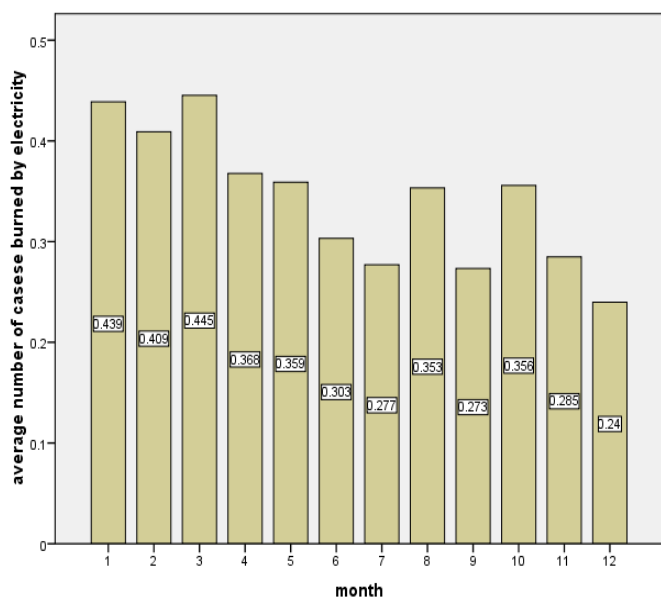
Average number of people burned by gas cylinders was significantly different in different months. Highest average was in February then in March and the lowest average observed in May ( $P$  value=0.013) (Fig. 9). There was significant difference about burned cases by explosive materials at different months, and it was apparently



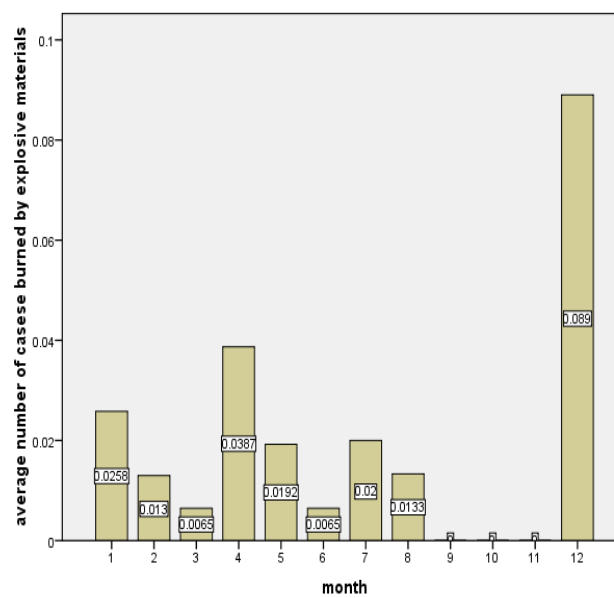
**Fig. 7.** Number of people burned by car accident



**Fig. 9.** Number of people burned by gas cylinders in different months



**Fig. 8.** Number of people burned by electricity in different months



**Fig. 10.** Burned cases by explosive materials at different months

higher in March and then in July rather than the other months. (P value<0.05) (Fig. 10).

In the first half of year there was positive correlation between the air temperature and the rate of burn injury so that with increasing temperature, the burn injury was higher (P value=0.001), (r=0.13) (Fig. 11).

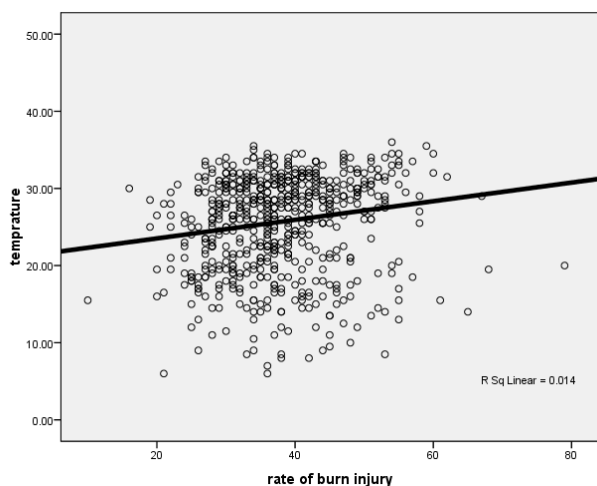
In the second half of year there was negative correlation between the air temperature and the rate of burn injury due to hot materials, so that with decreasing

temperature, the burn injury was higher (P value=0.047), (r=-0.8) (Fig. 12).

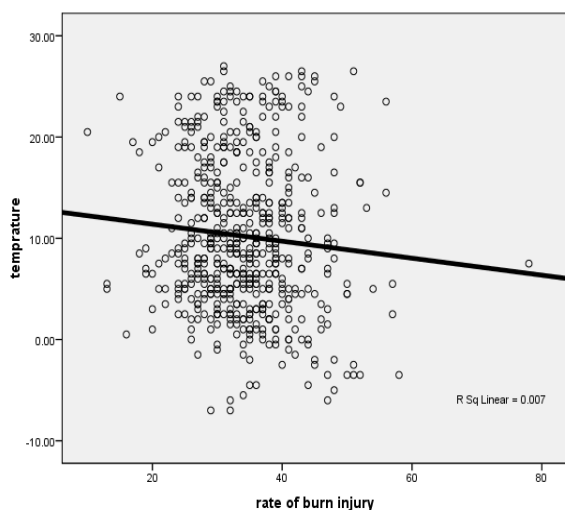
**4. Discussion:**

Based on our findings most burns were occurred in young age and male gender. Also burn rate was different based on various factors including different seasons and months of the year, different years, special occasions, Ramadan and the first and the last 15 days of the year.

In our study, the majority of hospitalized cases of burns were children with one year. In a similar study which was conducted in



**Fig. 11.**Correlation between the air temperature and the rate of burn injury in the first half of year



**Fig. 12.**Correlation between the air temperature and the rate of burn injury in the second half of year

Israel, young age was reported as a risk factor for the burns (6). High incidence of burns in children can be caused by lack of awareness and lack of attention to hazardous materials.

In many studies, burns have been reported the most in males (6-10). The higher prevalence of burn in men can attributed to the most hazardous jobs which they are involved in.

In our study the most admission to the urgency part of Shaheed Motahary hospital was in summer (July) and the lowest was in autumn (November) that appoint the importance of preparing services to patients.

In our study, the higher rate of electric burn injury in spring (July) was due to the sudden rise of temperature and service of cooler system that leads to electrocution.

Most of the burns by the flame and gas cylinders in the winter can be due to the increased use of heating appliances which use natural gas as its fuel source. Also, according to statistics which shows that most accidents occur in the summer when children's school is off and the family go traveling .and higher rate of burns due to explosives materials in March can be due to close proximity to the end of the year and the last Wednesday and most children have access to these materials.

In conclusion gender, low age and specific seasons and months of the year are considered as risk factors for burns. Due to the high number of cases of burns and these risk factors, it's better than authorities pay more attention to preventive measures; from the point of view of the improvement of living and working environments and teaching methods to deal with these risks and dangers. Educating people, especially male workers, parents and children in considering the safety and proper use of equipment in the home and workplace, perform first aid, changing in cooking methods and using standard heating equipment can also be helpful.

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