

A Study on Burn Epidemiologic Situation in Kermanshah, Iran in 2015

¹Behzad Karami Matin, ¹Farid Najafi, ²Mohammad Mahboubi, ³Touraj Ahmadi-Jouybari,

¹Soudabeh Eskandari and ¹Zeinab Moradinazar

¹Research Center for Environmental Determinants of Health,
Kermanshah University of Medical Sciences, Kermanshah, Iran

²Abadan School of Medical Sciences, Abadan, Iran

³Clinical Research Development Center, Imam Khomeini Hospital,
Kermanshah University of Medical Sciences, Kermanshah, Iran

Abstract: Burn is a death threatening damage which can cause disabilities and negative consequences to life. Burn has been known as the fourth major damage in the world. Considering the importance of burn damage and various social, economic and cultural structures in different regions, it seems necessary to gain knowledge on the issue in each region to plan prevention and treatment programs. The present study aims to determine burn epidemiologic situation in Kermanshah in 2015. It is a cross sectional, descriptive study making use of burn data registration sampling 296 hospitalized in Kermanshah, Iran. Data was gathered using a questionnaire including three parts on demographic, geographic and burn information. The SPSS Version 16 was used to analyze the data at $p < 0.05$. Patients mean age was 27.14 ± 20.54 . Patients included 51% male, 54.4% married, 40.5% unemployed, 41.5% illiterate. The most frequent cause of burn was oil combustion (26.4%) and the major reason was accidents (73.6%) at home (77%). The 42.3% of patients suffered from $< 25\%$ burns and 50% suffered from 3rd degree burns. About 11.5% patients died. There was a statistically meaningful relationship between age, gender, reason, burn degree, damaged organ and death due to burns ($p = 0.001$). Considering the results from the present study, it seems necessary to focus on education, social status and employment to limit burn cases. On the other hand, it would be essential to start a public training program to avoid accidents at home.

Key words: Epidemiologic, burns, Kermanshah, program, accident

INTRODUCTION

Burns have caused tragic accidents to individuals, their families and societies which cause physical, mental, economic and social damage. Burns have been known as major reasons to disabilities and death around the world and include 5-10% of fetal accidents in the world (Olaitan and Olaitan, 2004). In the recent years, damage from burns was so severe that it has been considered as a serious problem in the world today (Anlaty et al., 2002). Burns due to crashes, fallings and quarrels have been ranked as the fourth reason to trauma in the world. About 90% of burn cases occur in developing countries, especially eastern Asia, where the least was found in the United States (Peck and Jeschke, 2011). Almost 2 million people experience burns in the United States every year (Pelley, 2010). Which is the fifth reason to people death in America (Badger, 2001). Burns are also form a large percent of accidents in Iran (Afrasiabi and Karimi, 2002). Statistics showed that over 80% of burns could be

prevented. According to the reports from burn institute in America, each year 1,250,000 people are hospitalized for burns around the world while 2.4 million people experience severe burns in America so that they need treatments. It suggests that over 70,000 people are hospitalized and 5000 people die due to the burns (McLatchie et al., 2013). Results from studies in various countries suggested that burns resulted from fire were very common among youths. These studies reported 33.5-54.8% of mortality (Panjeshahin et al., 2001; Tabiee and Nakhaei, 2004). Burn injuries resulting from heat, chemicals or electricity lead to changes in proteins and reducing intravascular fluid volume. Burns have always been introduced as the most devastating damage which not only may cause disabilities, long term sever physical problems and death but also psychological and economic consequences (Low, 2007; Sadeghi et al., 2011). Over 11 million people experience burns which need medical interventions to recover. In 2011 WHO reported that over 300,000 people dies each year around the world as the result of burn

consequences (Mock *et al.*, 2008). About, 95% of which occur in underdeveloped countries (Forjuoh, 2006). Considering the reports of WHO in 2000 in Iran 4.01-4.08 out of 10,000 people die due to burn consequences; each year 150,000 out of 75 million people in Iran suffer from burns while only 500,000 out of 320 million people in the United States experience burns each year. It suggests the high rates of burn accidents in Iran. Furthermore, 3,000 people die due to burns in Iran; however the number decreased to 2000 in recent years (Taghavi *et al.*, 2010). In other hand, several studies noted, epidemiological studies is the first step is to design preventive interventions (Mirzaei *et al.*, 2015; Ali *et al.*, 2015; Jalilian *et al.*, 2015; Hosseini *et al.*, 2016; Alavijeh *et al.*, 2016; Jalilian *et al.*, 2016). Studies in Iran suggested various epidemiologic results and relationships among burns and its consequences. Maghsoudi *et al.* (2005) studied burns in children under 14 in Tabriz and suggested that fire burn was the most common reason to burns with 6.4% of mortality. The study reported average burn area as 19% (Maghsoudi *et al.*, 2005). In another study in Shiraz, burns by hot liquids were the most common cases followed by burns by fire. The average burn area was suggested to be 7.4%. However, it increased among men experiencing fire burns; Feck reported 9% of average burn area and suggested men, young adults and blacks as in danger groups experiencing burns while working (Ansari and Askarian, 2003). Liu *et al.* (2005) reported failure of internal organs, severe infections and inhalation injuries as major reasons to mortality due to burns.

The present study aims to investigate epidemiologic burns among patients attending specialist burn hospitals in Kermanshah, Iran, to distinguish prevention capacities and decrease mortality due to burns. No similar studies have been done on the issue before and the present study could be the base to future works.

MATERIALS AND METHODS

It is a cross sectional, descriptive study which made use of comprehensive program data recordings on burns among 296 patients hospitalized in Kermanshah, Iran, since April 2014 to February 2015. Samples were chosen based on census. A questionnaire was used to collect data. The instrument included three parts including demographic information (age, gender, education and occupation), geographic information (resident province, city and district) and burns (burn severity, grade, area, reason to burn, clinical consequences, all information in patients records completed by expert staff and interviews with patients and their accompanies). SPSS Software Version 16 was used to analyze the data. Descriptive

analyses statistical tests such as mean, standard deviation and frequency were used to describe the data and chi-square test was used to analyze the data ($p < 0.05$). This research has been approved by the Institutional Review Board at the Kermanshah University of Medical Sciences (KUMS.REC.1394.450).

RESULTS AND DISCUSSION

About 296 patients, 145 (49%) males and 151 (51%) females, with burns were investigated in the present study. Their average age was 27.14 ± 20.54 where the minimum and maximum ages were 1 and 87, respectively. Mortality rate was reported 11.5% in the present study. Most deaths (23.52%) was seen at age group 21-30 and there was a statistically meaningful relationship between deaths due to burns and gender ($p < 0.05$). Mortality rate from burn was 16.7% for educated patients and 8.9% for illiterates. There was no statistically meaningful relationship between education and clinical consequences resulted from burns. Considering occupation, 40.5% was unemployed. Also, mortality rate was 6.7% for unemployed patients and no meaningful associations were found among occupation and mortality rate due to burns (Table 1).

The 228 burns (77%) occurred at home and 33 cases (11.1%) happened at work. There was no meaningful relationship between location of the burns and its consequences to patients. Total 26% of burns occurred in the evenings and 25.7% happened in the morning. Also, no meaningful relationship was found between time of accidents and mortality rate ($p < 0.001$).

There was a statistically meaningful relationship between burn grade and burn mortality ($p < 0.001$). Burn area was $< 25\%$ the body and there was a meaningful relationship between burn location and burn consequences ($p < 0.05$).

The 26.4% of burns were due to hot oil, 8.8% resulted by gasoline, 24% by gas, 1% by acids, 2.7% by electricity, 1.7% by alcohol, 22.6% by hot water, 1% by warm objects and 11.8% by other materials. There was a meaningful relationship between what caused the burn and its mortality ($p < 0.001$). About 57.8% of patients hospitalized were living in cities and 42.2% were living in rural areas. Mortality rate due to burn was 14.4 and 9.4% for rural and urban patients, respectively.

Damage from burn is irreparable, it is preventable though. Burns have been introduced as a major reason to disabilities and deaths around the world. It is the reason to 5-2% of all traumas in the world and causes several physical, psychological, social and economic consequences (Mogharab *et al.*, 2014). Gender distribution among patients showed that 51% was males

Table 1: Number and percentage of the patients in the study

Variables	Death N(%)	Release N (%)	Total	p-values
Sex				
Male	11(32.4)	134 (51.1)	145 (49)	0.039
Female	23 (67.6)	128 (48.89)	151 (51)	
Age (year)				
0-10	0 (0)	81 (30.9)	81 (27.4)	0.001
11-20	6(17.6)	29(11.1)	35(11.8)	
21-30	8(23.5)	60(22.9)	68(23)	
31-40	7(20.6)	27(10.3)	34(11.5)	
41-50	1 (2.9)	39 (14.9)	40 (13.5)	
51-60	4 (11.8)	14 (5.3)	18 (6.1)	
<60	8 (23.5)	12 (4.6)	20 (6.8)	
Material				
Single	12 (35.3)	120 (45.8)	132 (44.6)	0.243
Married	21 (61.8)	140 (53.4)	161 (54.4)	
Divorced or Widow	1 (2.9)	2 (0.8)	3 (1)	
Educate				
Illiterate	11 (32.4)	113 (43.1)	124 (41.9)	0.370
Under diploma	22 (64.7)	135 (51.5)	157 (53)	
Associate degree	1 (2.9)	14 (5.3)	15 (5)	
Income (million rials)				
<5	9 (26.5)	89 (34)	98 (33.1)	0.421
8-5	14 (41.2)	104 (39.7)	118 (39.9)	
8-12	11 (15.5)	60 (22.9)	71 (24)	
12-20	0 (0)	9 (3.4)	9 (3)	
Social income				
Weak	10 (29.4)	93 (35.3)	103 (34.8)	0.780
Middle	21 (61.8)	147 (56.1)	168 (56.8)	
Good	3 (8.8)	22 (8.4)	25 (8.4)	

which corresponded to studies in other studies (Wasiak *et al.*, 2009; Rimdeika *et al.*, 2008; Shanmugakrishnan *et al.*, 2008; Hosseini *et al.*, 2007; Groohi *et al.*, 2002). Results from the present study reported that burn rate was almost equal between males (51%) and females (49%). However, similar studies in Iran suggested that burn rate was higher among females than males. Studies in Yasuj, Shiraz and Kurdistan reported higher burn rates among Iranian women (Panjeshahin *et al.*, 2001; Bazargani *et al.*, 2011). Studies on burn epidemiologic in under develop or developing countries reported that burns were more frequent between males at birth to the age of 4 and it was more common among females at higher ages (Forjuoh, 2006). The present study reported a statistically meaningful relationship between gender and burn consequences which matches results from studies in other studies (Lari *et al.*, 2000; Mabrouk *et al.*, 2003). Also, these studies suggested that females were more at the risk of death which matches the results from the present study reporting death rate 67.7% among females. The present study reported the highest rate of mortality (35.3%) among patients over 50 years old which corresponded to other similar studies (Forjuoh, 2006; Taghavi *et al.*, 2010; Mabrouk *et al.*, 2003; Saadat, 2005).

The resent study claimed that 27.4% of burns occurred among children under 10 which matches the results from others studies (Aghakhani *et al.*, 2013).

Furthermore, Mortality rate was reported 11.5% in the present study which was a higher rate than the results by Aghakhani *et al.* (2013). The present study related that 5.1% of hospitalized patients were educated while a significantly larger rate was illiterates or had not finished their high school studies. However, there was no statistically meaningful relationship between education level and burn variables. Among the patients who did not recover from burn, 32.4% was illiterate and 67.7% had not finished high school education.

CONCLUSION

Considering the results from the present study, it seems that focusing on education, social status and occupation could decrease burn frequency. On the other hand, since a large number on burns occurred at home, it seems that a public attempt to prevent burns at homes would be practical. Through the recent years, developed countries have focused on improving burn consequences and finding new treatments, therefore it seems essential to establish specialist burn centers and public trainings on burns in developing countries such as Iran.

ACKNOWLEDGEMENT

It is a part of a research confirmed Kermanshah University of Medical Sciences, Kermanshah, Iran.

REFERENCES

- Afrasiabi, F.A. and Z. Karimi, 2002. Causes and materials of burning among the patients hospitalized in Yasuj Shahid Beheshti Hospital. Armaghane Danesh J. Yasuj Univ. Med. Sci., 7: 39-46.
- Aghakhani, K., S. Mohammadi, A. Molanaei, A. Memarian and M. Ameri, 2013. Epidemiologic study of scald burns in victims in Tehran burn hospital. Tehran Univ. Med. Sci., Vol. 71.
- Alavijeh, M.M., M.B. Karami F. Jalilian, B. Hamzeh and M. Haghighi *et al.*, 2016. Relapse preventative intervention among Iranian addicts based on theory of planned behavior results. Res. J. Appl. Sci., 11: 138-143.
- Ali, M.M., M.J.Z. Sakhvidi, M. Gholianavval, D.M. Boroujeni and M.M. Alavijeh, 2015. Predictors of hepatitis B preventive behavioral intentions in healthcare workers. Safety Health Work, 6: 139-142.
- Anlatyey, R., O.R. Ozerdem, C. Dalay, E. Kesiktas and S. Acarturk *et al.*, 2002. A retrospective analysis of 1083 Turkish patients with serious burns: Part 2; Burn care, survival and mortality. Burns, 28: 239-243.
- Ansari, L.M. and M. Askarian, 2003. Epidemiology of burns presenting to an emergency department in Shiraz, South Iran. Burns, 29: 579-581.

- Badger, J.M., 2001. CE credit: Burns; The psychological aspects. *Am. J. Nurs.*, 101: 38-44.
- Bazargani, H.S., S. Arshi, R. Ekman and R. Mohammadi, 2011. Prevention-oriented epidemiology of burns in Ardabil provincial burn centre, Iran. *Burns*, 37: 521-527.
- Forjuoh, S.N., 2006. Burns in low-and middle-income countries: A review of available literature on descriptive epidemiology, risk factors, treatment and prevention. *Burns*, 32: 529-537.
- Groohi, B., R. Alaghebandan and A.R. Lari, 2002. Analysis of 1089 burn patients in province of Kurdistan, Iran. *Burns*, 28: 569-574.
- Hosseini, R.S., M. Askarian and O. Assadian, 2007. Epidemiology of hospitalized female burns patients in a burn centre in Shiraz. *Eastern Mediterranean Health J.*, 13: 113-118.
- Hosseini, S.N., M.M. Alavijeh, B.K. Matin, B. Hamzeh and H. Ashtarian *et al.*, 2016. Locus of control or self-esteem: Which one is the best predictor of academic achievement in Iranian college students. *Iran. J. Psychiatry Behav. Sci.*, Vol. 10, 10.17795/ijpbs-2602.
- Jalilian, F., H. Joulaei, M.M. Alavijeh, B. P. Samannezhad *et al.*, 2016. Cognitive factors related to cigarettes smoking among college students: An application of theory of planned behavior. *Social Sci.*, 11: 1189-1193.
- Jalilian, F., M. Ataee, M.B. Karami, M. Ahmadpanah and T.A. Jouybari *et al.*, 2015. Cognitive factors related to drug abuse among a sample of Iranian male medical college students. *Global J. Health Sci.*, 7: 143-151.
- Lari, A.R., R. Alaghebandan and R. Nikui, 2000. Epidemiological study of 3341 burns patients during three years in Tehran, Iran. *Burns*, 26: 49-53.
- Liu, X., Q. Luo, Y. Peng, J. Wang and Y. Huang *et al.*, 2005. Increase of the cure rate of burn patients by improving burn wound management methods. *Ann. Burns Fire Disasters*, 18: 11-15.
- Low, J.F.A., 2007. Its not just a burn: Physical and psychological problems after burns. Ph.D Thesis, Faculty of Medicine, Uppsala University, Uppsala, Sweden.
- Mabrouk, A., A. Maher and S. Nasser, 2003. An epidemiologic study of elderly burn patients in ain shams university burn Unit, Cairo, Egypt. *Burns*, 29: 687-690.
- Maghsoudi, H., A. Pourzand and G. Azarmir, 2005. Etiology and outcome of burns in Tabriz, Iran an analysis of 2963 cases. *Scand. J. Surg.*, 94: 77-81.
- McLatchie, G., N. Borley and J. Chikwe, 2013. *Oxford Handbook of Clinical Surgery*. 4th Edn., Oxford University Press, Oxford, England, ISBN: 978-0-19-969947-6, Pages: 779.
- Mirzaei, A.M., M. Mahboubi, F. Jalilian, A. Aghaei and J.T. Ahmadi, 2015. Factors related to self-breast examination based on health belief model among Iranian women. *Res. J. Med. Sci.*, 9: 105-108.
- Mock, C., M. Peck, M. Peden, E. Krug and W.H. Organization, 2008. *A WHO Plan for Burn Prevention and Care*. World Health Organization, Geneva, Switzerland.
- Mogharab, M., F. Sabzekar, G. Sharifzadeh and M. Azani, 2014. An epidemiological study of hospitalised patients with burns in Imam Reza hospital in Birjand between 2007 and 2013. *J. Birjand Univ. Med. Sci.*, 21: 228-236.
- Olaitan, P.B. and J.O. Olaitan, 2004. Burns and scalds-epidemiology and prevention in a developing country. *Med. J. National Assoc. Resident Doctors Niger.*, 14: 9-16.
- Panjeshahin, M.R., A.R. Lari, A. Talei, J. Shamsnia and R. Alaghebandan, 2001. Epidemiology and mortality of burns in the South West of Iran. *Burns*, 27: 219-226.
- Peck, M.D. and M.G. Jeschke, 2011. Epidemiology of burn injuries globally. *Burns*, Vol. 37,
- Pelley, T.J., 2010. The development and validation of the psychosocial adjustment to burn questionnaire for children age five and under. Ph.D Thesis, University of Dayton, Dayton, Ohio.
- Rimdeika, R., M. Kazanavicius and D. Kubilius, 2008. Epidemiology of burns in Lithuania during 1991-2004. *Med.*, 44: 541-547.
- Saadat, M., 2005. Epidemiology and mortality of hospitalized burn patients in Kohkiluyeh va Boyer-Ahmad province (Iran): 2002-2004. *Burns*, 31: 306-309.
- Sadeghi, B.H., H. Maghsoudi, N.M. Soudmand, F. Ranjbar and A.H. Mashadi, 2011. Stress disorder and PTSD after burn injuries: A prospective study of predictors of PTSD at Sina Burn Center, Iran. *Neuropsychiatric Dis. Treat.*, 7: 425-429.
- Shanmugakrishnan, R.R., V. Narayanan and P. Thirumalaikolundusubramanian, 2008. Epidemiology of burns in a teaching hospital in South India. *Indian J. Plast. Surg.*, 41: 34-37.
- Tabiee, S.H. and M. Nakhaei, 2004. Epidemiology of burn patients in Imam Reza Hospital, Birjand, 1998-2002. *J. Shahrood Univ. Med. Sci.*, 6: 43-51.
- Taghavi, M., M.R. Rasouli, N. Boddouhi, M.R. Zarei and A. Khaji *et al.*, 2010. Epidemiology of outpatient burns in Tehran: An analysis of 4813 cases. *Burns*, 36: 109-113.
- Wasiak, J., A. Spinks, K. Ashby, A. Clapperton and H. Cleland *et al.*, 2009. The epidemiology of burn injuries in an Australian setting, 2000-2006. *Burns*, 35: 1124-1132.