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Research Article

**EPIDEMIOLOGY OF BURN INJURIES IN MAJOR BURN
CENTER IN TAIF FROM 2015 TO 2017**

Mamdouh Mohammed Mahbub¹, Abdullah Saad Rizq Allah Althobaiti², Mojahed Seraj
Mahmoud joharji³, Abdulaziz Ahmed Abdulaziz⁴, Samir Badr⁵

¹ Medical Student, Faculty of Medicine, Taif University, ² Medical Student, Faculty of Medicine,
Taif University, ³ Medical Student, Faculty of Medicine, Taif University, ⁴ Medical Student,
Faculty of Medicine, Taif University, ⁵ Assistant Professor of Surgery, Faculty of Medicine,
Taif University

Abstract

Background: Burns are stand out among the most well-known and devastating forms of injury. Patients with serious thermal injury need immediate specialized care in order to minimize morbidity and mortality. As indicated by the World Health Organization (WHO) burn injuries in East Mediterranean Region (EMR), Saudi Arabia is included; stay one of the main causes of morbidity and mortality among all injuries. The incidence in the East Mediterranean Region (EMR) was 187 per 100,000 per year. In America, the incidence was 19 per 100,000 per year.[7]

Methodology: retrospective study, with data collected from medical records of all patients, admitted to a burn center between 18 August 2015 and 23 August 2017 in King Faisal Hospital (KFH) Taif, Saudi Arabia. Medical records were examined to determine demographics (age, gender), admission date, total body surface area (TBSA), type of burns, length of hospital stay (LOS) and mortality. by using a pre-designed questionnaire to help to gather information and will be analyzed by the statistical package for the social science (SPSS).

Objectives: to assess the most affected age group in Taif and most common type of burn injury and detriment total body surface area, affected part by burn injury, the length stays in hospital and mortality rate due to burn injury, All this to assess the epidemiology of burns in Taif for 2 year.

Keywords: Burn - Burns - Saudi - Prevalence - Hospitalized Burns Patients - Taif - KSA

Corresponding author:

Mamdouh Mohammed Mahbub

Tel: +966531943123, Tel: +996537416344

Email: mamdoh.9173@hotmail.com

QR code



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INTRODUCTION:

Burns are a major cause of injury around the world. The World Health Organization estimates that the lifetime evaluates that the lifetime occurrence of extreme burns is 1% [1]. And that more than 300,000 individuals pass on every year from fire-related burns worldwide [2]. In addition, the prevalence of burns is essentially higher in developing countries than in developed ones. Because of harm to the skin and different organs, burns can lead to open wounds, disability, death, major financial outcomes, severe emotional and psychological complications, and financial burden. Along these lines, burn patients require not only intense essential treatment but also subsequent rehabilitation, reconstruction, and long-term anti-scar therapy. Although more than 90% of all burns are preventable, burns remain common and are a major public health problem [3]. The leading causes of death among major burn cases are sepsis (78–85% of all burn-related deaths) [4,5]. In patients with severe burns over more than 40% of the total body surface area (TBSA), 75% of all mortality is currently related to sepsis from burn wound infection or other infection complications and/or inhalation injury (21, 22, 23, 24, 25). The survival rates for burn patients have enhanced generously in a previous couple of decades because of advances in present-day medicinal care in specialized burn centers. Enhanced results for seriously burned patients have been attributed to medical advances in fluid resuscitation, nutritional support, pulmonary care, burn wound care, and infection control practices. Thus, burn-related deaths, depending on the extent of the injury, have been halved within the past 40 years [8, 17, 18, 11, 19, 20]. Data from the National Center for Injury Prevention and Control in the United States show that approximately 2 million fires are reported each year which result in 1.2 million people with burn injuries. [8,9,10,11] Moderate to severe burn injuries requiring hospitalization account for approximately 100,000 of these cases, and about 5,000 patients die each year from burn-related complications [8, 9, 10, 11, 12, 13]. In Canada, the evaluated quantities of burn victims and deaths in serious cases are relatively smaller on a per capita basis [14, 15, 16]. As indicated by the World Health Organization (WHO) burn injuries in East Mediterranean Region (EMR), Saudi Arabia is included; stay one of the main causes of morbidity and mortality among all injuries [6]. The incidence in the East Mediterranean Region (EMR) was 187 per 100,000 per year. In America, the incidence was 19 per 100,000 per year [7]. The

World Health Organization (WHO) estimates that 310,000 people died in fires in 2004 across the world. The East Mediterranean Region (EMR) showed a mortality rate of 5.6 deaths per 100,000, which was higher than the global mortality rate, 4.8 per 100,000 per year. The World Health Organization (WHO) estimates that 29,000 deaths occurred in the East Mediterranean Region (EMR) only [7]. The aim of this study is to analyze demography, type of burn, affected part of the body, total body surface area (TBSA), length of hospital stay (LOS) and mortality rate of patients of burn injuries in Taif, Saudi Arabia. In addition, to identify the most affected age group, most common type of burn among adult and older. And start preventive measures and public awareness to decrease the incidence of these burns.

MATERIALS AND METHODS:

We will conduct a retrospective review of the clinical charts of all consecutive burn patients admitted to the Burn Unit of King Faisal Hospital, Taif, Saudi Arabia. over 2 years between 18 August 2015 and 23 August 2017. All patients admitted to the Burn Unit during this period were included in the study. We excluded patients with missing data. The charts were reviewed for age, gender, type of burn, site of injury, total body surface area (TBSA), length of hospital stay (LOS) and mortality. A literature review for previous burn publications from Saudi Arabia was conducted using the Medline database (PubMed) and google scholar database (scholar.google) using the keywords: Burn [ti] OR Burns [ti] AND Saudi [ti]. The results were reviewed for any burn studies. Data entered on a Microsoft Office Excel sheet 2010. Then data entry and Statistical analysis were by using statistical package for the social science (SPSS) program for Windows version 21.

RESULTS:

A total of 271 burn cases were admitted during the study period. Out of these admissions 191 (70.5%) were male, and 80 (29.5%) were female. And The mean and median ages were 24.5 and 23.0, respectively. And 27 infants representing 10.0% of the study population were admitted and 90 teens (aged 19 and below), representing 33.2% of the study population were admitted. 136 adults aged between 20 and 50 represented the largest proportion of burn admissions from 2015 to 2017 at 50.2%. and 18 older aged (more the 60) were admitted representing 6.7% of study population

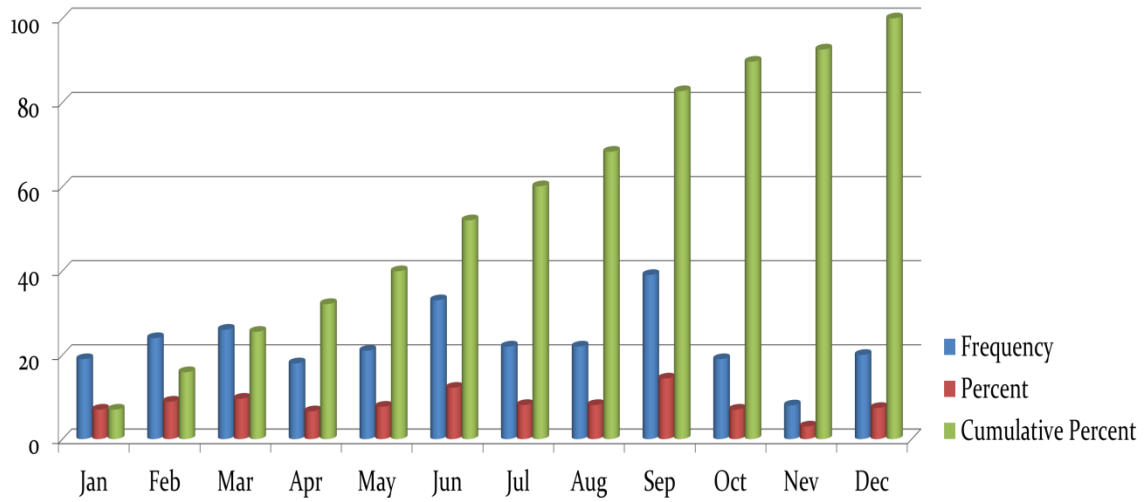


Fig.1. Monthly Admissions

The monthly admissions data is shown in Fig.1. No major fluctuations were observed for most of the months except for September and June.

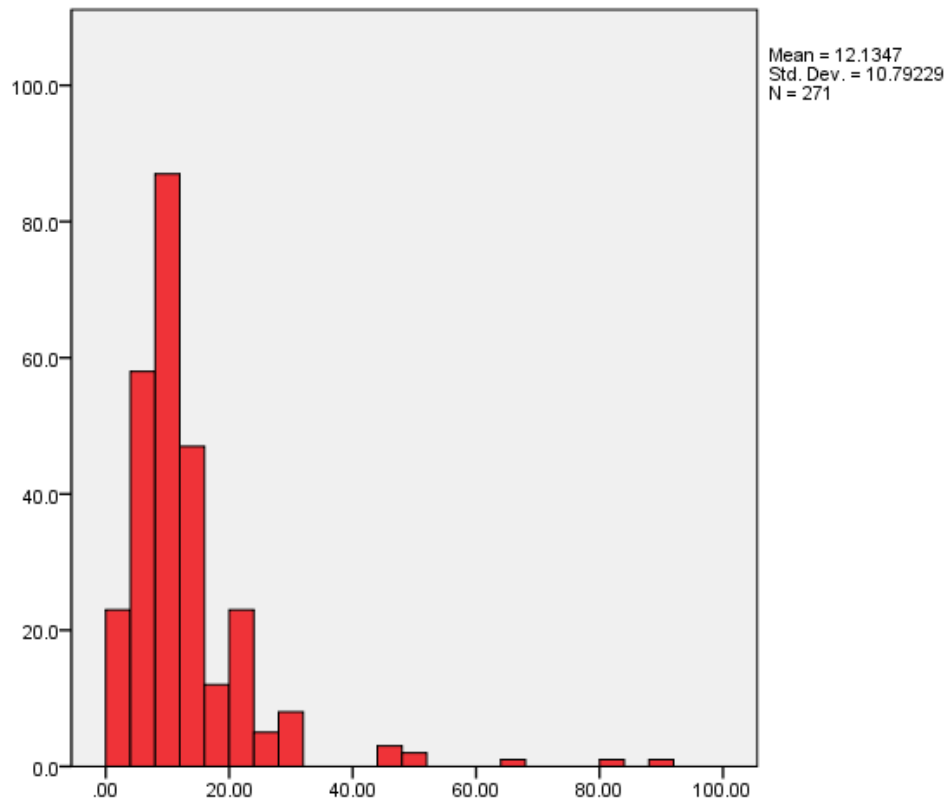


fig.2. Total body surface area %

The distribution of burn size (TBSA) for the study population is shown as a histogram in Figs.2. The mean and median TBSA were 12.1 and 10.0%, respectively. Burn patients with 10% TBSA and less representing 62.4% of the study population and burn patients with TBSA between 11% and 29% representing 32.1% and burn patients with TBSA 30% and more representing 5.5%.

Type of burn	Frequency (N)	Percent (%)
scald	130	48.0%
flame	109	40.2%
electric	18	6.6%
chemical	12	4.4%
flash	2	0.7%

Table 1 - Type of burn injury

The most widely recognized reason for burn damage is by scalding (hot water/beverages, hot oil, and steam) at 130 (48.0%) followed by flame burn at 109 (40.2%) electrical burn is the third most common cause of injury at 18 (6.6%) shown in table 1. This is followed by chemical and flash burns, respectively. The overall mortality in this study population is 2 or 0.7% of total admissions.

Table 2 - Affected body part

Affected part	Frequency (N)	Percent (%)
Head	36	13.3%
Upper limb	46	17.0%
Trunk	12	4.4%
Perineum	9	3.3%
Lower limb	51	18.8%
Head and upper limb	28	10.3%
Head and upper limb and lower limb	6	2.2%
Head and trunk	20	7.4%
head and upper limb and trunk	1	0.4%
Head and trunk and upper limb and lower limb	1	0.4%
head and trunk and lower limb	3	1.1%
Head and lower limb	4	1.5%
Upper and lower limb	16	5.9%
Upper and lower limb and trunk	1	0.4%
Trunk and upper limb	18	6.6%
Trunk and lower limb	17	6.3%
Perineum and lower limb	2	0.7%

Table 2 summarizes the number and percentage of body parts recorded among the admitted patients. The lower limb was the most affected body part, recorded in 51 patients (18.8%). The upper limb was second with 46 patients (17.0%).

Table 3 – Characteristics of burn injured patients.

Variable	Gender		X ²	P-value				
	Male N, (%)	Female N, (%)						
Affected Part	Head	30 (83.3%)	6 (16.7%)	10.475	0.841			
	Upper limb	30 (65.2%)	16 (34.8%)					
	Trunk	7 (58.3%)	5 (41.7%)					
	Perineum	7 (77.8%)	2 (22.2%)					
	Lower limb	35 (68.6%)	16 (31.4%)					
	Head and upper limb	18 (64.3%)	10 (35.7%)					
	Head and upper and lower limbs	4 (66.7%)	2 (33.3%)					
	Head and trunk	15 (75.0%)	5 (25.0%)					
	Head and trunk and upper limb	1 (100.0%)	0 (0.0%)					
	Head and trunk and upper and lower limbs	1 (100.0%)	0 (0.0%)					
	Head and trunk and lower limb	3 (100%)	0 (0.0%)					
	Head and lower limb	3 (75.0%)	1 (25.0%)					
	Upper and lower limb	13 (81.3%)	3 (18.8%)					
	Upper and lower limbs and trunk	1 (100.0%)	0 (0.0%)					
	Trunk and upper limb	12 (66.7%)	6 (33.3%)					
	Trunk and lower limb	10 (58.8%)	7 (41.2%)					
	Perineum and lower limb	1 (50.0%)	1 (50.0%)					
	Type of burn	Scald	81 (62.3%)			49 (37.7%)	9.743	0.045*
		Flame	83 (76.1%)			26 (23.9%)		
		Electrical	16 (88.9%)			2 (11.1%)		
Chemical		9 (75.0%)	3 (25.0%)					
Flash		2 (100.0%)	0 (0.0%)					
Mortality	Yes	2 (100.0%)	0 (0.0%)	0.844	0.358			
	No	189 (70.3%)	80 (29.7%)					
Year	2015	26 (92.9%)	2 (7.1%)	8.171	0.017*			
	2016	82 (65.6%)	43 (34.4%)					
	2017	83 (70.3%)	35 (29.7%)					
Season	Winter	57 (71.3%)	23 (28.8%)	3.038	0.386			
	Spring	47 (72.3%)	18 (27.7%)					
	Summer	49 (63.6%)	28 (36.4%)					
	Autumn	38 (77.6%)	11 (22.4%)					
Age Categories	infants	19 (70.4%)	8 (29.6%)	5.738	0.571			
	teens	59 (65.6%)	31 (34.4%)					
	20s	43 (72.9%)	16 (27.1%)					

	30s	28 (77.8%)	8 (22.2%)		
	40s	19 (61.3%)	12 (38.7%)		
	50s	8 (80.0%)	2 (20.0%)		
	60s	6 (75.0%)	2 (25.0%)		
	70+	9 (90.0%)	1 (10.0%)		
Total body	less than 11	116 (68.6%)	53 (31.4%)	4.046	0.132
surface area	11 - 29	61 (70.1%)	26 (29.9%)		
categories	more than 29	14 (93.3%)	1 (6.7%)		

Table 3 show that in univariate analyses, burn male differed significantly from female with respect to the following factors: Type of burn ($p = 0.045$), Year ($p = 0.017$).

DISCUSSION:

This study presents data illustrating the patterns of burns in patients admitted to the major burn center in Taif. In our study sum of 271 burn cases was admitted during the study period. Out of these admissions 191 (70.5%) were male, and 80 (29.5%) were female. what shows male have higher incidence to get burn injury comparing to female and this is different from the study that had been done in Saudi Arabia that found female have a higher incidence than male [26]. But this result is as same to the study that had been done in Singapore and show the number of male with burn injury in study is higher than female [27]. The male predominance in our study could be identified with the way that young men are more associated with higher work-related dangers that will probably cause burns [30,31]. In our study we find that 27 infants representing 10.0% of study population were admitted and 90 patients (aged 19 and below), representing 33.2% of study population were admitted. 136 adults aged between 20 and 50 represented the largest proportion of burn admissions from 2015 to 2017 at 50.2%. and 18 older aged (more the 60) were admitted representing 6.7% of study population. Adult between age 20 and 50 are the highest incidence burn injury in our study which goes as same to the study that has been done in Singapore [27]. And older age group go as the less incidence of burn injury with 18 patients (6.7%) and this finding is similar to the study that has been done in Saudi Arabia in 435 patients 6% ware older age patients [26]. Our result suggest that adult people more likely to have burn injury than children witch go will with the study from united state [28]. The most admission by seasons was summer and winter and by months was September and June this may be credited to the local festivities, for example Ramadan, Eid al-Fitr and Eid al-Adha when mass cooking and firework activities, respectively, occur and this supported by the study from Saudi Arabia [29]. The distribution of burn size (TBSA) for the study population is shown that mean and median TBSA were 12.1 and 10.0%, respectively. Burn

patients with 10% TBSA and less representing 62.4% of the study population and burn patients with TBSA between 11% and 29% representing 32.1% and burn patients with TBSA 30% and more representing 5.5%. with teen age group representing about 38.5% of study population with TBSA less than 11% witch the higher among all age group and teen age group also representing 26.4% of the study population with TBSA from 11%-29% which also the highest among all age group and adult at 20s representing 40% of study population with TBSA more than 29% and this result is different from Singapore study [27]. The larger part of our admissions presented with less than 10% TBSA which is in the similar to other studies [32,33]. The most widely recognized reason for burn damage is by scalding at 130 (48.0%) similar to other studies [27,36]. followed by flame burn at 109 (40.2%) electrical burn is at 18 (6.6%) and chemical burn at 12 (4.4%) and flash at 2 (0.7). wherein another study the most common causes of burn injury was flame [26]. Most common site of the burn was lower limb(18.8%), upper limb(17%) followed by head(13.3%). This data was similar to research was done in Turkey and Nepal [34,35]. Comparing to study was done in Lebanon upper lime was most parts affected [36].

CONCLUSION:

Adult are at high risk of having scald burns. We also noted the number of admissions is increasing every year. Therefore, an effective scientific-based prevention program required. To prevent serious burns in our region, there ought to be a healthcare system in each company and organization; workers ought to be prepared and trained about burn materials before work; all buildings ought to have an automatic fire alarm and fire extinguishers ought to be put on each floor of each building. Moms ought to be instructed during pregnancy and their child's infancy on the best way to avoid pediatric burns. They have to know the most well-known reasons for pediatric burns. Also, family psychology consultations must become more common to prevent unfortunate events

including burns.

REFERENCES:

- Murray, C.J., Lopez, A.D. and World Health Organization, 1996. The global burden of disease: a comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020: summary.
- Mock, C., Peck, M., Peden, M., Krug, E. and World Health Organization (WHO), 2008. A WHO plan for burn prevention and care. Geneva: World Health Organization, p.3
- Ahn, C.S. and Maitz, P.K., 2012. The true cost of burn. *Burns*, 38(7), pp.967-974.
- Laupland, K.B., Parkins, M.D., Church, D.L., Gregson, D.B., Louie, T.J., Conly, J.M., Elsayed, S. and Pitout, J.D., 2005. Population-Based Epidemiological Study of Infections Caused by Carbapenem-Resistant *Pseudomonas aeruginosa* in the Calgary Health Region: Importance of Metallo- β -Lactamase (MBL)-Producing Strains. *Journal of Infectious Diseases*, 192(9), pp.1606-1612.
- Greenhalgh, D.G., Saffle, J.R., Holmes IV, J.H., Gamelli, R.L., Palmieri, T.L., Horton, J.W., Tompkins, R.G., Traber, D.L., Mazingo, D.W., Deitch, E.A. and Goodwin, C.W., 2007. American Burn Association consensus conference to define sepsis and infection in burns. *Journal of burn care & research*, 28(6), pp.776-790.
- World Health Organization, 2010. *International travel and health: situation as on 1 January 2010*. World Health Organization.
- World Health Organization, 2004. *International statistical classification of diseases and related health problems* (Vol. 1). World Health Organization.
- American Burn Association, 2000. Burn incidence and treatment in the US: 2000 fact sheet. *Chicago: ABA*.
- Pruitt, B.A. and Mason, A., 1996. Epidemiological, demographic, and outcome characteristics of burn injury. *Total Burn Care*. London: D. Herndon Ed., Saunders Co, 13.
- Barillo, D.J. and Goode, R., 1996. Fire fatality study: demographics of fire victims. *Burns*, 22(2), pp.85-88.
- Hamerly, T., Everett, J.A., Paris, N., Fisher, S.T., Karunamurthy, A., James, G.A., Rumbaugh, K.P., Rhoads, D.D. and Bothner, B., 2017. Detection of *Pseudomonas aeruginosa* biomarkers from thermally injured mice in situ using imaging mass spectrometry. *Analytical Biochemistry*.
- American Burn Association, 2000. Burn incidence and treatment in the US National health interview survey (1991–1993 data). *American Burn Association, Philadelphia, Pa*.
- Hunt, J. L. 2000. The 2000 presidential address. Back to the future: the ABA and burn prevention. *J. Burn Care Rehabil.* 21:474–483.
- Mandelcorn, E., M. Gomez, and R. C. Cartotto. 2003. Work-related burn injuries in Ontario, Canada: has anything changed in the last 10 years? *Burns* 29:469–472
- Pickett, W., Hartling, L., Brison, R.J. and Guernsey, J.R., 1999. Fatal work-related farm injuries in Canada, 1991-1995. *Canadian Medical Association Journal*, 160(13), pp.1843-1848.
- Angus, D.E., Cloutier, E., Albert, T., Chenard, D., Shariatmadar, A., Pickett, W. and Hartling, L., 1998. The economic burden of unintentional injury in Canada. *The SMARTRISK Foundation, Ontario, Canada*.
- Lionelli, G. T., E. J. Pickus, O. K. Beckum, R. L. Decoursey, and R. A. Korentager. 2005. A three decade analysis of factors affecting burn mortality in the elderly. *Burns* 31:958–963.
- Crawley-Coha, T., 2002. Childhood injury: a status report, part 2. *Journal of pediatric nursing*, 17(2), pp.133-136.
- Saffle, J. R., B. Davis, and P. Williams. 1995. Recent outcomes in the treatment of burn injury in the United States: a report from the American Burn Association Patient Registry. *J. Burn Care Rehabil.* 16:219–232
- National Center for Health Statistics (US), 1993. *Healthy people 2000 review 1992* (Vol. 91). Dept. of Health and Human Services Public Health
- Ters for Di.
- Atiyeh, B. S., S. W. Gunn, and S. N. Hayek. 2005. State of the art in burn treatment. *World J. Surg.* 29:131–148.
- Baker, C. C., C. L. Miller, and D. D. Trunkey. 1979. Predicting fatal sepsis in burn patients. *J. Trauma* 19:641–648.
- Bang, R. L., P. N. Sharma, S. C. Sanyal, and I. Al Najjadah. 2002. Septicaemia after burn injury: a comparative study. *Burns* 28:746–751.
- Barrow, R. E., M. Spies, L. N. Barrow, and D. N. Herndon. 2004. Influence of demographics and inhalation injury on burn mortality in children. *Burns* 30:72–77.
- Fitzwater, J., G. F. Purdue, J. L. Hunt, and G. E. O'Keefe. 2003. The risk factors and time course of sepsis and organ dysfunction after burn trauma. *J. Trauma* 54:959–966.
- Al-Shlash, S., Warnasuriya, N.D., Al Shareef, Z., Filobos, P., Sarkans, E. and Al Dusari, S., 1996. Eight years experience of a regional burns unit in Saudi Arabia: clinical and epidemiological aspects. *Burns*, 22(5), pp.376-380.
- Song, C. and Chua, A., 2005. Epidemiology of burn injuries in Singapore from 1997 to

2003. *Burns*, 31(1), pp.S18-S26.
28. Bessey, P.Q., Arons, R.R., DiMaggio, C.J. and Yurt, R.W., 2006. The vulnerabilities of age: burns in children and older adults. *Surgery*, 140(4), pp.705-717.
29. Al-Qattan, M.M., 2000. Burns in epileptics in Saudi Arabia. *Burns*, 26(6), pp.561-563.
30. Lee, S.T., 1982. Two decades of specialised burns care in Singapore, 1961-1982. *Annals of the Academy of Medicine, Singapore*, 11(3), pp.358-365.
31. Ngim, R.C., 1992. Epidemiology of burns in Singapore children--an 11-year study of 2288 patients. *Annals of the Academy of Medicine, Singapore*, 21(5), pp.667-671.
32. Iqbal, T., Saaiq, M. and Ali, Z., 2013. Epidemiology and outcome of burns: Early experience at the country's first national burns Centre. *Burns*, 39(2), pp.358-362.
33. Bataineh, Z.A., Al Quran, T.M., Al Balas, H. and Khammash, M.R., 2018. Pattern of burn injury at north of Jordan. *International journal of burns and trauma*, 8(1), p.1.
34. Albayrak, Y., Temiz, A., Albayrak, A., Peksöz, R., Albayrak, F. and Tanrikulu, Y., 2018. A retrospective analysis of 2713 hospitalized burn patients in a burns center in Turkey. *Ulusal travma ve acil cerrahi dergisi= Turkish journal of trauma & emergency surgery: TJTES*, 24(1), pp.25-30.
35. Karki, B., Rai, S.M., Nakarmi, K.K., Basnet, S.J., Magar, M.G., Nagarkoti, K.K. and Thapa, S., 2018. Clinical epidemiology of acute burn injuries at Nepal Cleft and Burn Centre, Kathmandu, Nepal. *Annals of plastic surgery*, 80(3), pp.S95-S97.
36. Gilbert, A.D., Rajha, E., El Khuri, C., Chebl, R.B., Mailhac, A., Makki, M. and El Sayed, M., 2018. Epidemiology of burn patients presenting to a tertiary hospital emergency department in Lebanon. *Burns*, 44(1), pp.218-225.