

## Epidemiology of Burns in Meknes, Morocco

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### Abstract

### Original Research Article

This study was prospectively carried out on 134 acutely burned patients admitted to the Burn Unit of Mohammed V hospital in Meknes, Morocco, during the period from the 1 January 2017 to the 31 December 2018, with the objective to analyze the epidemiological features of burned patients in our country. The means of age and percentage total body surface area burned (TBSB) were 21,6% years and 22,6%, respectively. Most of the patients were city dwellers. Females (56%) were more prevalent than males (44%). Adults (66,4%) superceded children (33,6%). Male children (35,6%) population exceeded female children (32%). In contrast, adult females (68%) surpassed adult males (64,4%). The commonest burn location was home followed by work then, outdoors locations. Females were most commonly burned at home and mainly suffered from scald and flame burns. Males were most commonly burned at work and home locations than in outdoors and mainly sustained flame and scald burns. There was no difference in the mean percentage TBSB and burn depth in both sexes. Children were mostly burned at home and were mainly victims of scald and flame burns. The results of this study show the epidemiological data that will enable us to better prevent burns in our country.

**Keywords:** Epidemiology, Burned patients.

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## INTRODUCTION

Burns are one of the most sever kind of trauma that may ever affect a human being, it is a real health problem around the world affecting the patient and the caregivers physically, psychically, mentally and materially [1,2].

As in other developing countries, burns are considered as major health problem in Morocco, especially after the arabian spring, people start to burn themselves as a way of protest. The unit of burns in Meknes receives patients from the region and sometimes even those from the rest of Morocco (not enough centers in the country).

This study was prospectively carried out in the burn unit of Mohammed V hospital in Meknes, Morocco. The objective was to analyse risk factors, demographic and epidemiological features of burned patients admitted to the unit. We also compared our results with those of other studies to elucidate risk factors for better prevention, which remains the only way to avoid this trauma.

## MATERIEL AND METHODS

This study was prospectively carried out on 134 burned patients admitted to the burn unit of Mohammed V hospital in Meknes, Morocco, during the period of 1 January 2017 to 31 December 2018. This unit had 5 beds, It is a well-equipped unit with an operating theater, a dressing room with a balneotherapy. The data collected in the study included:

- general patient profiles including demographic and occupational characteristics
- place of the accident
- causes of the burns
- extent of burn injury (TBSB (%) and depth)

## RESULTS

A total of 482 acutely burned patients presented to the emergencies of Mohammed V hospital in Meknes, Morocco during the period from the first January 2017 to the 31 December 2018. Of this total, 134 patients (27,8%) were admitted to the unit of burns according to the adopted policy of admission.

### Yearly distribution

Table 1: shows the yearly distribution of admissions to the Burn Unit from 1 January 2017 to 31 December 2018, the highest number is in 2017 and from month to month of this year the number was lowest.

**Table-1: Yearly distribution of hospital admissions**

year	number	percentage
2017	75	55,9
2018	59	44,01
total	134	100

**Demographdics**

Table 2 : illustrates the distribution of the 134 patients in relation to age and sex. The ages ranged from 6 months to 82 years with a median of 21,6 years. Adults constituted 66,4% while children (0–14 years)

accounted for 33,6% of the patients' population. Females pre dominated as they accounted for 56% in relation to males (44%). In children, males (45,6%) superceded females (32%). In adults, females (68%) were more prevalent than males (44%).

**Table-2: Patients' distribution according to age and sex**

Age	Male (%)	Female (%)	Total (%)
6months-14 years	21 (35,6)	24 (32)	45 (33,6)
15- 82 years	38 (64,4)	51 (68)	89 (66,4)
total	59 (44)	75 (56)	134 (100)

**Place of residence**

Table 3 shows the place of residence of the 134 patients included in the study. Most of the patients

(69,4%) came from urban (city) areas and the rest (30,6%) were inhabitants of rural (village) areas.

**Table-3: Patients residence (urban or rural)**

Place of residence	number	pourcentage
Urban	93	69,4
rural	41	30,6
total	134	100

Accident location in relation to the sex

Table 4 : Illustrates the correlation between injury location and sex. The commonest location for males was at work (47.45%), followed by home (38,9%), then outdoors(1 3,5%). Females were mostly burned at home (94.6%), and a small percentage in outdoor locations (1. 3%).

**Table-4: Accident location in relation to the sex**

location	Male (%)	Female (%)	Total (%)
home	23 (38,9)	71 (94,6)	94 (70,1)
work	28 (47,45)	- (0)	28 (20,8)
outdoors	8 (13,5)	4 (1,3)	12 (8,9)
total	59 (44,01)	75 (55,9)	134 (100)

**Accident location in relation to the age**

Table 5 illustrates the relation between accident location and age. Most children were burned at home (93.3%), followed by outdoors

(0,7%). In adults, the home ranked first (58,45%), followed by work (31,45%), then outdoors locations (10,1%).

**Table-5: Accident location in relation to the age**

location	0-14 years (%)	>15 years (%)	Total (%)
home	42 (93,3)	52 (58,45)	94 (70,1)
work	- (0)	28 (31,45)	28 (20,9)
outdoors	3 (0,7)	9 (10,1)	12 (9)
total	45 (33,6)	89 (66,4)	134 (100)

**Burn causes**

Table 6 illustrate the pourcentage of the burn causes, the principal cause is flame (50%),

followed by hot water (26,8%), followed by hot liquid (17,9%) than electric cause (5,2%).

**Table-6: Burn causes**

Burn causes	number	pourcentage
Hot water	36	26,8
Hot liquids	24	17,9
flame	67	50
electric	7	5,2
total	134	100

**Burn causes in relation to the sex**

Table 7 illustrates the relation between burn cause and sex. In males, the commonest cause was flame (61,5%), followed by hot water (20%), than

electric injuries and hot liquids(10.7 and 7,7%, respectively). In females, the commonest cause was hot water (52,1%), followed by flame(39,1%), then hot liquid (27,5%).

**Table-7: Burn causes in relation to the sex**

Burn cause	Male (%)	Female (%)	Total (%)
Hot water	13 (20)	23 (52,1)	36 (26,8)
Hot liquids	5 (7,7)	19 (27,5)	24 (17,9)
Flame	40 (61,5)	27 (39,1)	67 (50)
Electric	7 (10,7)	_ (0)	7 (5,2)
Total	65 (48,5)	69 (51,5)	134 (100)

**Burn causes in relation to age**

Table 8 illustrates the relation between burn cause and age. In children, the commonest cause was hot water (62.2%), followed by hot liquids (28.8%), then flame and electrical injuries (6,6 and 2,2%,

respectively). In adults, flame burns ranked first (71,9%), followed by hot liquids(12,35%), then hot water and electrical injuries (8,9and 6,7%, respectively).

**Table-8 : Burn causes in relation to age**

Burn cause	0-14 years (%)	>15 years (%)	total
Hot water	28 (62,2)	8 (8,9)	36 (26,8)
Hot liquids	13 (28,8)	11 (12,35)	24 (17,9)
Flame	3 (6,6)	64 (71,9)	67 (50)
electric	1 (2,2)	6 (6,7)	7 (5,2)
total	45 (33,6)	89 (66,4)	134 (100)

**Burn depth**

Table 9 shows that second-degree lesions are much more frequent (70,9%) than third-degree lesions (29,1%).

**Table-9: Burn depth**

degrees	number	pourcentage
second	95	70,9
third	39	29,1
total	134	100

**Burn depth in relation to age**

Table 10 illustrates the relation between burn depth and age. Children sustained more partial

thickness (60%) than full thickness burns (40%). In adults, there was more partial thickness (76,4%) than full thickness burns (23,6%).

**Table-10: Burn depth in relation to age**

Burn depth	0-14 years (%)	>15 years (%)	Total (%)
Second degree	27 (60)	68 (76,4)	95 (70,9)
Third degree	18 (40)	21 (23,6)	39 (29,1)
total	45 (33,6)	89 (66,4)	134 (100)

### Percentage of total burn surface of body TBSB in relation to sexe

The percentage of TBSB ranged from 6 to 80% with a median of 22,62%. Most burns fell in the 15–24% range (37,3%), followed by the 25–49% range

(24.6%), then the 1–14% range (23.35%), and lastly the over 50% range (5.2%) (Table 11). There was no big difference in the mean percentage of TBSB in both sexes.

**Table-11: Percentage of TBSB in relation to sexe**

TBSB (%)	Male (%)	Female (%)	Total (%)
1-14	17 (28,8)	21 (28)	38 (23,35)
15 -24	23 (39)	27 (36)	50 (37,3)
25-49	17 (28,8)	16 (21,3)	33 (24,6)
>50	2 (3,4)	5 (6,6)	7 (5,2)
total	59 (44)	75 (66)	134 (100)

### Pourcentage of TBSB in relation to age

Table 12 illustrates the relation between percentage of TBSB and age. In children, the 1–14% range ranked first (42.2%), followed by the 15–24% range (33.3%), then the 25–49 % range and the over

50% range (20% and 4.4%, respectively). In adults, the 15–24% range came first (39.3%), followed by the 25–49% range (26.9%), then the 1–14% range and the over 490% range (21,34 and 5,6%, respectively).

**Table-12 : percentage of TBSB in relation to age**

TBSB (%)	0-14 years (%)	>15 years (%)	Total (%)
1-14	19 (42,2)	19 (21,34)	38 (23,35)
15-24	15 (33,3)	35 (39,3)	50 (37,7)
25-49	9 (20)	24 (26,9)	33 (24,6)
>50	2 (4,4)	5 (5,6)	7 (5,2)
total	45 (33,6)	89 (66,4)	134 (100)

## DISCUSSION

This study was prospectively carried out on 134 acutely burned patients admitted to the Burn Unit of Mohammed V hospital in Meknes, Morocco, during the period from 1 January 2017 to 31 December 2018. Our objective was to analyze risk factors, demographic, and epidemiological features of patients in our area.

Analysis of age and sex record in our study showed that adults (66,4%) superceded children (33,6%). This finding matches to an egyptian study [1]. The study comprised more females (56%) than males (44%). Comparing age to sex showed that burned male children (35,6%) prevailed over female children (32%), while the reverse was true in adults. The overall female predominance in our study conforms with some previous reports [1,3] and contrasts other epidemiological studies [1,4,5] The fact that males predominated in childhood while females prevailed in adulthood comes in agreement with what has been previously mentioned in the literature [1,3,4,6,7]. Regarding accident location, our study showed that the home ranked first, followed by work, then outdoors locations.

Studying the burn location in relation to sex showed that the home was the commonest location for burns in females, as they were mostly housewives and children. In males, burns occurred mostly at work. There is a major problem in our country lying in the fact that male children with low socioeconomic

background work without security, especially for day laborers.

Our study showed that the commonest burn cause in males was flame(61.5%). This is due to the fact that, at home, males are mainly concerned with changing the gas bottle, also as a form of protest they burn them selfs (arab spring). In contrast to males, we found that females were mostly victims of hot water, since they were, as housewives mainly concerned with cooking. In our study, the commonest percentage of TBSB fell in the 15–24% range. Our results showed no difference in the mean percentage of TBSB and depth of burn injury in both sexes. this result is consistent with an Egyptian study [1].

Analysis of accident location in relation to age revealed that most children sustained their burn injury at home. In respective studies done in Hong Kong and Japan, Cheng *et al.* [8] and Fukunishi *et al.* [9] concluded that burns in children are preventable since they mostly occur while the parents are with their children at home. They stressed that programs to prevent burn accidents at home should be directed towards both children and their parents [1].

In our study, we also verified the burn cause in relation to age. We found that children were mostly victims of scald (91%), followed by flame (6,6%) burns. The reason for this is the extensive use of little gas bottle (3kg) for cooking and boiling water in the slum areas of Meknes. As a matter of fact, children are

often left to play, unattended by their mothers, around gas bottle put on the ground. Concerning electrical injuries, they accounted for 2.2% of our child accidents, and they were mainly due to playing with exposed cords, plugs, and outlets [1, 10, 11, 9, 12].

Burns in children tended to be rather second than full thickness in depth since they were mostly induced by boiling water and other liquids. This finding is in accordance with the reports of previous authors [8, 10, 9, 12].

## CONCLUSION

Burning is a real health problem, female is more affected than male, it is mainly a domestic accident whose main causal agent is the scalding and the flame mainly due to the use of the small bottle of gas, which is at the origin of the burn in male and child also, where the interest of banish these small bottles of gas, by informing the whole population of its very important risks, as well as educating the parents to watch well their children.

Prevention is the best way to avoid this tragedy

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