# Study of Medicolegal Aspects of Burnt Cases (Fatal and Non-Fatal) Admitted to Plastic Surgery Department, Sohag University Hospitals: Retrospective Study

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#### ABSTRACT

KEYWORDS Seasonal Variations; Aspects; Scald; Medicolegal; Burn Degrees.

Burn injuries have an impact on both the physical and psychological well-being of victims; they can cause deterioration of skin cells, tissues, and organs too. Burn injuries in Egypt represent a major problem as compared with malignancy, heart diseases, and road accidents. The current work aimed to study medicolegal aspects of burnt (fatal and non-fatal) cases admitted to the Plastic Surgery Department at Sohag University Hospitals over three years. A retrospective study included 564 reports and data collected from records from 1 January 2019 to the end of December 2021. Data collected; age, gender, residence, seasonal variations, diurnal variations, degree, site, percent and cause of burn, duration of hospital stay, fate of cases, survival duration, cause of death, place of occurrence, and manner of burn. The study showed that preschool children were the most affected age group by burn (41.2%), with males more affected than females but not statistically significant, burnt cases in rural areas (70.6%) more than urban (29.4%) with a significant difference. Most cases occurred in winter (54%) and afternoon (53.3%) with seasonal and diurnal statistical significance. Burn occurred more indoors (94.1%) with more scald cases (62.4%), and most cases were second-degree (70.6%). Cardiogenic shock was the most frequent cause of death in burnt cases. The study of medicolegal aspects of burn cases found that children under 7 years were the most affected, with most incidents in rural areas and during winter. Accidental scald burns were the most common, with males more frequently affected.

#### Introduction ·

A burn is damage to the skin or other tissues caused by direct or indirect contact with high temperatures, chemicals, electricity, radiation, or friction (Mehta and Tudor, 2021).

The psychological and physiological effects of a severe burn injury, whether from

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\*Corresponding author: Wafaa Abdel-Ghaffar Ali, Forensic Medicine and Clinical Toxicology Department, Faculty of Medicine, Sohag University, Egypt. E-mail address: wafaaabdelghaffar02@gmail.com, Tel:01003713695 exposure to harmful substances or just a lack of social support, may have a profound impact on a person's ability to function in their daily lives and at work. Due to the recent deformities, functional losses, and trauma experienced by patients seen in an adult burn clinic, in addition to the psychological components go into maintaining that compliance with the lengthy treatment and recovery process, the mental health of these patients grows a crucial factor (Pallua et al., 2019).

Among the top causes of disabilityadjusted life-years in poor countries, burns rank high (WHO, 2020).

Burning is a frequent method of murder and suicide across the globe. According to

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Yadav et al., (2019), it ranks as the fourth most common kind of trauma globally, behind interpersonal violence, vehicle accidents, and falls.

Damage from burns may affect a person's mental and physical health. Damage to skin cells, tissues, and organs may also result from burns (Swaroop Sonone et al., 2020)

In Egypt, burn injuries rank high on the list of problems, right up there with heart ailments, cancer, and car accidents (Mabrouk, 1987).

Although burns are a common cause of injury all over the world, many studies focus on real-world health problems regarding patterns of burns in the Middle Eastern area which have not been reported yet in Upper Egypt (Ahmed, 2019).

During the three-year period beginning on January 1<sup>st</sup>, 2019, and ending on December 31, 2021, this research aimed to examine the medicolegal elements of burned (fatal and non-fatal) patients admitted to the Plastic Surgery Department at Sohag University Hospitals, as well as the severity of the burn condition.

#### Subjects and methods:

#### Research design:

This paper describes burn patients hospitalized in the Burn Unit at Sohag University Hospitals using a retrospective cohort study. The protocol was approved by the Institutional Review Board and the Research Ethics Board of Sohag University (The approval number was IRB Soh-Med-22-09-24). Confidentiality was guaranteed by keeping all data anonymous.

#### Study population and data collection:

The present study included 564 reports; data collected from patient hospital records over three years from the first of January 2019 to the end of December 2021.

#### Registered data:

Data collected from records: age, gender, residence, seasonal variations, diurnal variations, degree of burn, site of the burn, percent of the burnt area (total body surface area TBSA affection), cause of the burn, duration of hospital stay, the fate of injured persons, survival duration, cause of death, place of occurrence and manner of burn injuries.

- [Infant > one year, toddlers one to three years, children 4-17 years, young adults 18-39 years, mid aged adults 40-59 years, elderly ≥ sixty years] is the age range for the children and adults (Ebrahem et al., 2022).
- Sex (male/female)
- Urban or rural areas of residence
- Seasonal variations (summer/winter/autumn/ spring)
- Diurnal variations (morning/ afternoon/ night)
- The severity of the burn, from first to fourth (Aydogdu et al., 2021).
- Burn location (genitalia, upper and lower limbs, back, trunk (chest and abdomen), upper and lower extremities, and scalp).
- According to Williams and Wohlgemuth (2013), the rule of nines is used to determine the percentage of total body surface area involved.
- Burn source (flame, electrical, chemical or scald).

- Duration of hospital stay.
- Fate of cases (recovery/death).
- Survival duration.
- Mechanism of death (cardiogenic shock, septic shock, respiratory complications, neurogenic shock, electrolyte disturbance, multi organ failure).
- Place of occurrence (indoors/ outdoors).
- Mode of burn injuries (accidental/ suicidal/ homicidal).

## Inclusion criteria:

From the beginning of 2019 through the end of 2021, all burn patients treated at the Burn Unit at Sohag University Hospitals, such as:

- All age groups
- Recent burn cases
- All degrees of burn

*Exclusion criteria:* old burn cases are excluded.

## Statistical analysis of data

A version 26 of the Statistical Package for the Social Sciences (SPSS) for Windows was used to tabulate and analyze the data that was obtained. We employed descriptive statistics, which were expressed as numbers and percentages. The post hoc Chi-square test ( $\chi$ 2) was run when the comparison between the three years was significant to show pairwise comparison between the years. According to Elliott and Woodward (2007), a p-value less than 0.05 is deemed statistically significant.

Prior to automated data input, the acquired data was double-checked and coded. With the help of SPSS version 26, the gathered data was statistically evaluated and presented in graphical and tabular formats. We used the Kolmogorov-Smirnov test to make sure the data was normal. For nominal data, the Chi-square test was used. First Kruskal-Wallis was applied, then Mann-Whitney for pairwise comparisons. The Mann-Whitney U test is used for numerical data that is not parametric. Applying Spearman correlation to non-parametric data allows one to see correlation. Degree of burn, age, and percentage of burn were assessed as predictors of death using the receiveroperating characteristics (ROC) curve. Accuracy, sensitivity, and specificity rates were computed.

## Results

Figure (1) shows the percentage of burn cases over the three years. The results in 2020 showed an increased number of burnt cases, with a percentage of 47.2%, while in 2019, it was 22.5%.



# Percentages of frequency of the cases in the 3 years (n=561)

Fig. (1): Pie chart showing the frequency of burn cases in the different 3 years

Table (1) shows that the most affected group was < 7 years (Preschool) with 64.7% of cases in 2021, and 41.2% overall across the three years. This is statistically significant (P < 0.001).

Other age groups had fewer cases, with teenagers (15-25 years) representing 22.1% and adults (25-40 years) representing 15.3% overall across the three years.

Males were consistently more affected than females, making up 63.3% of total cases, although this difference was not statistically significant (P = 0.2).

Rural areas exhibited more burn cases (70.6%) than urban areas (29.4%) overall, with a significant difference between the two groups (P = 0.008).

Parameters	(2019) (2020)		(20	21)	To	otal	P value		
Age groups	n=126	%	n=265	%	n=170	%	n=561	%	-
<7 years (Preschool)	43	34.1%	78	29.4%	110	64.7%	231	41.2%	P<0.001*
7-15 years (school)	21	16.7%	38	14.3%	14	8.2%	73	13%	P1 = 0.7
15-25 years (teenager)	23	24.6%	71	26.8%	22	12.9%	124	22.1%	P2<0.001* P3<0.001*
25-40 years (adult)	21	16.7%	49	18.5%	16	9.4%	86	15.3%	
> 40 years (elder)	10	7.9%	29	10.9%	8	4.7%	47	8.4%	
Sex	n=126	%	n=265	%	n=170	%	n=561	%	
Male	77	61.1%	162	61.1%	116	68.2%	355	63.3%	P=0.2 P1=0.9
Female	49	38.9%	103	38.9%	54	31.8%	206	36.7%	P2=0.2 P3=0.1
Residence	n=126	%	n=265	%	n=170	%	n=561	%	
Urban	36	28.6%	93	35.1%	36	21.2%	165	29.4%	P=0.008* P1=0.2
Rural	90	71.4%	172	64.9%	134	87.8%	396	70.6%	P2=0.1 P3-0.002*

 Table (1): Age, sex, residence of burned cases in years 2019, 2020, 2021

Pearson's chi-square test \*P < 0.05 (significant), P1 between 2019 and 2020, P2 between 2019 and 2021, P3 between 2020 and 2021 n = number, % = Percentage

Table (2) shows that the majority of burn incidents occurred in winter (54% overall). Summer followed with 34.8% of cases. Seasonal variation was statistically significant (P < 0.001).

Most cases occurred in the afternoon (53.3%), with the night period showing a rise in 2021 (47.1%). The overall diurnal pattern was statistically significant (P < 0.001).

Most cases were accidental (93.6%), with a significant difference between accidental, homicidal, and suicidal cases.

Most burns occurred indoors (94.1% overall), with a highly significant difference between indoor and outdoor incidents (P < 0.001).

Scald burns were the most common (62.4% overall), followed by flame burns (32.1%). There was a statistically significant difference in the type of burns (P = 0.025).

Most cases showed second-degree burns (70.6%), with a significant difference between the years (P = 0.02).

The overall recovery rate was 91.6%, significantly different across the years (P = 0.003).

 Table (2): Circumstance of burn, diurnal and seasonal variation distribution of burned cases in years 2019, 2020, 2021.

Denemotions	(20	)19)	(2020)		(2021)		Te	otal	D h	
Parameters	n=126	%	n=265	%	n=170	%	n=561	%	- P value	
Seasonal variation										
Autumn	2	1.6%	17	6.4%	0	0%	19	3.4%	P<0.001*	
Spring	11	8.7%	22	8.3%	11	6.5%	44	7.8%	P1=0.1	
Summer	31	24.6%	78	29.4%	86	50.6%	195	34.8%	P2<0.001*	
Winter	82	65.1%	148	55.8%	73	42.9%	303	54%	P3<0.001*	
Diurnal variation										
Afternoon	73	57.9%	160	60.4%	66	38.8%	299	53.3%	P<0.001* P1=0.7	
Morning	20	15.9%	34	12.8	24	14.1%	78	13.9%	P2=0.001*	
Night	33	26.2%	71	26.8%	80	47.1%	184	32.8%	P3<0.001*	
Mode of burn										
Accidental	125	99.2%	240	90.6%	160	94.1%	525	93.6%	P=0.028*	
Homicidal	0	0%	13	4.9%	5	2.9%	18	3.2%	P1=0.005*	
Suicidal	1	0.8%	12	4.5%	5	2.9%	18	3.2%	P2=0.06 P3=0.4	
Place of occurrence										
Indoors	125	99.2%	237	89.4%	166	97.6%	528	94.1%	P<0.001*P1=0.001*	
Outdoors	1	0.8%	28	10.6%	4	2.4%	33	5.9%	P2=0.3 P3=0.001*	
Type of burn										
Chemical	1	0.8%	1	0.4%	2	1.2%	4	0.7%	P=0.025*	
Electric	3	2.4%	13	4.9%	11	6.5%	27	4.8%	P1=0.006*	
Flame	27	21.4%	98	37%	55	32.4%	180	32.1%	P2=0.039	
Scald	95	75.4%	153	57.7%	102	60%	350	62.4%	P3=0.5	
Degree of burn										
$2^{nd}$	102	81%	173	65.3%	121	71.2%	396	70.6%	P=0.02*	
3 <sup>rd</sup>	22	17.5%	86	32.5%	48	28.2%	156	27.8%	P1=0.006* P2=0.07	
$4^{\text{th}}$	2	1.6%	6	2.3%	1	0.6%	9	1.6%	P3=0.2	
Survival outcome										
Recovered	123	97.6%	244	92.1%	147	86.5%	514	91.6%	P=0.003* P1=0.03*	
Died	3	2.4%	21	7.9%	23	13.5%	47	8.4%	P2=0.001* P3=0.06	
Pearson's chi-square tes	t * P < 0.05	(signific	ant) P1	between	2019 and	d 2020				

P2 2019 and 2021 P3 between 2020 and 2021 n = number, % = Percentage

The data provided on the duration of stay (days) and (%) across the years reveals some interesting trends (Table 3 and Figure 3). For the duration of stay, the median value remained consistent, with 7 days reported for 2019 and 2020, and 6 days for 2021. The interquartile ranges (IQR) were similar, and the overall range of hospital stay expanded over the years, from 1-70 days in 2019 to 1-330 days by 2021. Despite this widening range, there was no statistically significant difference in the median duration of stay across the years, as indicated by the P-values (P = 0.5). This suggests that while some patients experienced extended stays, the typical length of stay for most patients did not change dramatically over time.

In contrast, the percentage of burnt areas showed notable variation across the years. The median burn percentage increased from 15% in 2019 to 18% in 2020, before slightly decreasing to 16% in 2021. The ranges also grew, with a minimum burn percentage of 0.5% in 2021 and a maximum of 99%. The P-values reflect statistically significant differences between vears. particularly between 2019 and 2020 (P = 0.02), 2020 and 2021 (P = 0.007), and 2019 and 2021 (P = 0.049). Despite this, the overall comparison across all years did not yield a significant difference (P = 0.7). This indicates that while the percentage of burns fluctuated year by year when taken as a whole, these changes were not significant across the entire study period.

**Table (3):** Duration of hospital stay and percentage of burnt area comparisons 2019, 2020 and<br/>2021.

Para	ameters	2019 n=126	2020 n=265	2021 n=170	Total	P value	P1	P2	Р3
Duration of stay (days)	Median (IQ) Range	7(2-12.25) 1-70	7(3-13) 1-210	6(3-13.25) 1-330	7(3-13) 1-330	0.5	0.2	0.6	0.5
Percentage of burnt area (%)	Median (IQ) Range	15(8-22) 1-90	18(11-26) 1-99	16(10-26.5) 0.5-98	16(10-25) 0.5-99	0.02*	0.007*	0.049*	0.7

\*P < 0.05 (significant) IQ=interquartile, P compares the 3 years by the Kruskal-Wallis test

P1 between 2019 and 2020 P2 2019 and 2021 P3 between 2020 and 2021 by Mann-Whitney test

Table (4) presents data on the mechanism of death across the years 2019, 2020, and 2021, with a total of 47 deaths during this period. The most frequent mechanism of death over the three years was cardiogenic shock, accounting for 36.2% of all deaths. In 2019, it was the sole cause of death, contributing to 100% of the cases for that year. In subsequent years, its proportion decreased, but it remained a significant cause of mortality, representing 23.8% of deaths in 2020 and 39.1% in 2021. This difference in distribution is statistically significant, with a P-value of 0.02.

Other causes of death also varied Respiratory across the years. failure accounted for 19.1% of deaths overall, peaking in 2020 at 28.6%. Electrolyte disturbance caused 19.1% of deaths overall similar to respiratory failure. Multiorgan failure, which was not reported in 2019 or 2020, emerged in 2021, contributing to 17.4% of deaths, and infections and septic shock became а significant cause in 2021, representing 26.1% of deaths that year.

While neurogenic shock accounted for only one death (2.1%) during the study period, the overall trends indicate a shift in the causes of death from predominantly cardiogenic shock in 2019 to a more diverse range of causes by 2021. This change reflects a broader pattern of evolving complications, with infections and multiorgan failure becoming more prominent in later years.

Table (4): Mechanism of death in 47 burned cases in 2019, 2020 and 2021.

Mechanism of death		2019	2020	2021	Total	P value	
Cardiogenic shock	n %	3 (100%)	5 (23.8%)	9 (39.15)	17 (36.2%)		
Respiratory failure	n %	0 (0%)	6 (28.6%)	3(13%)	9(19.1%)		
Multiorgan failure	n %	0 (0%)	0 (0%)	4 (17.4%)	4 (8.5%)		
Electrolyte disturbance	n %	0 (0%)	8(38.1%)	1(4.3%)	9(19.1%)	0.01*	
Neurogenic shock	n %	0 (0%)	1(4.8%)	0(0%)	1(2.1%)		
Infections and septic shock	n %	0 (0%)	1(4.8%)	6 (26.1%)	7(14.9%)		
Total	n %	3 (100%)	21 (100%)	23(100%)	47(100%)		

\*<0.05 is significant by chi-square test, n= number

strong as the percentage of burn, it was a fairly reliable predictor.

Age, with a cut-off point of >29.5 years, had the weakest predictive power, with an AUC of 0.62 and a confidence interval of 0.52 to 0.7. Its sensitivity was relatively low at 42.6%, but its specificity was higher at 83%, meaning it was better at correctly identifying negative outcomes. However, the overall accuracy rate of 62% made age a less reliable predictor compared to the percentage and degree of burn.

In summary, the percentage of burnt body area is the most accurate predictor of outcomes, followed by the degree of burn, while age shows lower predictive reliability.

Figure (2) shows the relation between the degree of burn and hospital stay in which third-degree burn represented more prolongation of hospital stay.

The of variables analysis the (percentage of burnt area, degree of burn, and age) shown in Table (5) and Figure (4), revealed varying levels of predictive power for outcomes (The percentage of burn of more than 29% had an excellent predictive value of mortality about 95% with sensitivity 87% and specificity 86%), it can reliably identify both positive and negative outcomes, achieving an overall predictive power of 95%. This makes the percentage of burn the most reliable predictor.

Table (5) also evaluated the degree of burn, with a cut-off point of >2, showed moderate predictive power, with an AUC of 0.753 and a confidence interval of 0.67 to 0.82. Its sensitivity was 74.5% and specificity was 74.8%, giving it a balanced ability to predict outcomes. The overall accuracy rate was 75.3%, indicating that while it is not as

**Table (5):** Receiver operative characteristic curve of age, degree of burn, and percentage of the burnt area as a predictor of mortality

Variable	Best Cut off point	95% CI	AUC	P-value	Sensitivity (%)	Specificity (%)	Accuracy rate
Percentage of burnt area	>29%	0.92-0.97	0.951	< 0.001*	87.2%	86.6%	95%
Degree of burn Age (years)	>2.5 >29.5	0.67-0.82 0.52-0.7	0.753 0.62	<0.001* 0.007*	74.5% 42.6%	74.8% 83%	75.3% 62%

AUC (Area under the curve), CI: confidence interval \*P value <0.05 is considered significant



# **Discussion:**

A burn is defined as acute damage to the skin or other tissues, usually caused by heat, chemicals, electricity, or radiation. Burn injuries are a frequent type of trauma that leads to high rates of morbidity and mortality (Chithrani et al., 2020).

Among the most costly forms of trauma, burns need lengthy hospital stays, extensive rehabilitation, and costly wound and scar treatment. One of the leading causes of injury-related mortality and morbidity worldwide is burn injuries. There are physical, mental, and social impacts on burn victims (Sarma et al., 2022).

Burns are also of medicolegal significance, as they can result from domestic or workplace accidents, as well as abuse or neglect, particularly involving children and the elderly. Globally, burns represent a major public health challenge, with an estimated 265,000 deaths annually (Das et al., 2023).

In addition, burns are commonly used as methods of suicide and homicide worldwide. After road traffic accidents, falls, and interpersonal violence, burns rank as the fourth most common cause of trauma. Burn injuries not only affect the physical health of victims but also take a toll on their psychological well-being. Burns can severely damage skin cells, tissues, and even internal organs (Simonit et al., 2024).

This three-year research set out to examine the medical and legal considerations surrounding the admission of burn patients (both fatal and nonfatal) to the Burn Unit at Sohag University Hospitals, as well as the scope of the burn issue.

In the present study it was found that children under 7 years were the most affected by burns, making up 64.7% of cases in 2021 and 41.2% overall. Other age groups, including teenagers and adults, are less impacted, this is in agree with the study of Ebrahem et al. (2022) who found that most burnt patients were among the age groups of toddlers (1-3 years) with a percentage of (34.2%) and children (4-17 years) with a percentage of (26%). Males account for 63.3% of cases, though this is not statistically significant, this is consistent with Ebrahem et al. (2022) whose study showed that there was an increase in the percentage of number of burned male victims which represented (68.9%)than female patients which represented (31.1%), also there was a significant increase of burnt cases in rural areas with a percentage of 64.9% like that found in the present study in which burns were more prevalent in rural areas (70.6%) versus urban areas (29.4%), with a significant difference. Most incidents occur in winter (54%) and during the afternoon (53.3%), showing significant seasonal and diurnal trends, these results were consistent with Kandeel et al. (2019) who showed that seasonal variation was noticed as regards rate of burn occurrence, as the largest percentage was in winter (33.7%), followed by spring (31%), summer (26.5%) while autumn has lower rates (8.8%). A higher rate of burn occurrence in winter season may be due to the need for using heating devices, burning wood and warm water for domestic purposes.

Accidental burns represent 93.6% of cases, reflecting significant year-to-year variation. The majority occur indoors (94.1%), with significant differences between indoor and outdoor incidents, Ebrahem et al. (2022) when came to the location of burn injuries found that the majority (92.7 %) occurred at home as that found in the present work.

As regard the cause of burn in the present study, scald burns were the most

common (62.4%), followed by flame burns (32.1%), electric burns (4.8%) while electric burn was the least (0.7%), with significant differences in causes, similar to the results of the present study Ebrahem et al. (2022) stated that scald was the most frequent cause of burn injuries (50.5%), followed by flame (42.2%), electrical damage (7.1%), and chemical injury (0.1%).

Most burns are second-degree (70.6%), with significant variation across years, and the overall recovery rate is 91.6%, this nearly to that found by Ebrahem et al. (2022) most burn injuries were of second degree with a percentage of 39.7 %.

The data on hospital duration of stay and percentage of burn over the years show distinct trends. The median duration of stay remained stable at 7 days for 2019 and 2020, and 6 days for 2021, despite the overall range expanding from 1-70 days in 2019 to 1-330 days in 2021. There was no statistically significant difference in the median stay across the years, suggesting that most patients experienced similar lengths of stay overtime. In contrast, the percentage of burn varied more notably. The median burn percentage increased from 15% in 2019 to 18% in 2020, then slightly decreased to 16% in 2021. The burn range also widened, from 0.5% to 99% by 2021. Statistically significant differences were observed between specific years, particularly between 2019 and 2020, 2020 and 2021, and 2019 and 2021. However, the overall difference across all years was not significant, indicating that while yearly fluctuations were notable, the overall trend remained consistent.

These go in the same line with Vidhate et al. (2017) who found that 42.1% of all patients required a hospital stay of two to seven days. All patients included in the research had an average duration of stay of seven days. Although electrolyte disturbance (8.5%), respiratory tract problems (12%), shock (36%), sepsis (16%), and shock (34%) were the leading causes of death among burn patients, 84% of burn cases were successfully treated.

Peranantham et al. (2014) reported that the length of hospital stay was significantly correlated positively with the degree of burn, with a fourth-degree burn requiring a longer stay. This makes sense given that they require longer-term medical care.

The causes of death from 2019 to 2021, with 47 total deaths recorded. The leading cause of death throughout the period was cardiogenic shock and circulatory failure, accounting for 36.2% of deaths. In 2019, this was the sole cause, responsible for 100% of deaths, though its proportion decreased in later years to 23.8% in 2020 and 39.1% in 2021, a statistically significant shift. Other causes varied over time. Cardio-respiratory failure represented 19.1% of deaths, peaking at 28.6% in 2020. Multiorgan failure, absent in 2019 and 2020, appeared in 2021, accounting for 17.4% of deaths. Cardiogenic shock with electrolyte disturbance was noted only in 2020, contributing to 19% of deaths, while electrolyte disturbance alone accounted for 10.6% overall. Infections and septic shock became significant in 2021, causing 26.1% deaths. Neurogenic shock caused only one death (2.1%) over the three years.

Hasan et al. (2019) stated that sepsis was the leading cause of death, responsible for 50% of the cases. Multi-organ failure followed, contributing to 25% of the deaths. Less frequent causes included respiratory failure (15%), shock (8%), and brain death, which accounted for 2% of the fatalities.

The most common bacteria recovered from septic patients was Pseudomonas, according to Krishnan et al. (2013), who found that multi-organ failure due to sepsis was the leading cause of mortality. Obtaining post-mortem reports was a major hassle, and the results of the coroners' investigations didn't match up with the clinical cause of death.

According to research by Kandeel et al. (2019), the length of time someone survives varies significantly depending on the reason they died. Although all septicemia patients died after more than three days, 52 percent of respiratory failure deaths occurred between three to seven days, and 77.8 percent of shock deaths occurred in less than three days. Because skin is the body's first line of defense against infectious diseases, and burns compromise its integrity. Sepsis is more likely to occur when systemic inflammation and immunosuppression caused by burns occur together.

The analysis of predictive variables for outcomes shows that the percentage of burn is the most reliable indicator, with a cutoff of >29%, an AUC of 0.951, and an accuracy rate of 95%. It demonstrates high sensitivity (87.2%) and specificity (86.6%), making it the strongest predictor. The degree of burn has moderate predictive power, with a cut-off of >2.5, an AUC of 0.753, and an accuracy rate of 75.3%. It offers balanced sensitivity and specificity (both around 74.5%). Age, with a cut-off of >29.5 years, has the weakest predictive power, with an AUC of 0.62, low sensitivity (42.6%), and a lower accuracy rate of 62%, making it the Overall. least reliable predictor. the percentage of burn is the best predictor, followed by the degree of burn, while age is less dependable.

Halgas et al. (2018) discovered that the APACHE II score, age, and total body surface area (TBSA) burnt were substantial, independent risk factors for patient death. The most accurate model for predicting burn mortality was FLAMES, which includes Fatality by Longevity, APACHE II score, Measured Extent of burn, and Sex. It even outperformed the model created especially for this research group. The updated Baux score, a simpler model, was also proven to be reliable in predicting burn mortality and is regarded as being therapeutically helpful.

Zavlin et al. (2018) showed that of the burn patients who did not survive, 3.3% died, and more than half (52%) of those fatalities happened in the first seven days following admission, diabetes, inhalation injuries. diabetes. lack of insurance, and the requirement for surgical operations were the biggest independent risk factors for death. The total body surface area burnt and age were revealed to be statistically significant continuous risk factors for death, although overall comorbidities were not.

In conclusion: The study of medicolegal aspects of burn cases found that children under 7 years were the most affected, with most incidents occurring in rural areas and during winter. Accidental scald burns were the most common, with males more frequently affected. These results emphasize the need for improved burn care, preventive measures. and better medicolegal documentation.

# **Recommendations:**

- 1- Increase the awareness of population about the gravity of burn and how to avoid its occurrence by using more advertising in television and social media.
- 2- Awareness about the importance of rapid moving to hospital after burn for rapid management and avoidance of disfigurement and complications.

3- Children need more observations by caregivers as they are more vulnerable to burn and its complications.

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دراسة الجوانب الطبية الشرعية لحالات الحروق (المميتة والغير مميتة) المقبولة بقسم جراحة التجميل بمستشفيات جامعة سوهاج: دراسة بأثر رجعي

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إصابات الحروق لها تأثير كبير على الصحة الجسدية والنفسية للضحية؛ يمكن أن يسبب تدهور في خلايا الجلد والأنسجة والأعضاء أيضًا. حيث تمثل إصابات الحروق في مصر مشكلة كبيرة مقارنة بالأورام الخبيثة وأمراض القلب وحوادث الطرق.

يهدف العمل الحالي إلى در اسة الجو انب الطبية الشرعية لحالات الحروق (المميتة وغير المميتة) التي يتم إدخالها إلى قسم جراحة التجميل بمستشفيات جامعة سو هاج على مدى ثلاث سنوات.

شملت دراسة بأثر رجعي 564 تقريرًا، وتم جمع البيانات من السجلات من 1 يناير 2019 إلى نهاية ديسمبر 2021. تم جمع البيانات؛ العمر، الجنس، مكان الإقامة، التغيرات الموسمية، الاختلافات اليومية، الدرجة، الموقع، النسبة المئوية وسبب الحرق، مدة الإقامة في المستشفى، مصير الحالات، مدة البقاء، سبب الوفاة، مكان حدوث الحرق، وطريقة الحرق.

أظهرت الدراسة أن الأطفال في مرحلة ما قبل المدرسة هم الفئة العمرية الأكثر تأثراً بالحروق في (41.2%)، وكان الذكور أكثر تأثراً من الإناث، ولكن ليست ذات دلالة إحصائية، وكانت حالات الحروق في المناطق الريفية (70.6%) أكثر من المناطق الحضرية (29.4%) مع اختلاف كبير. حدثت غالبية الحالات في الشتاء (54%) وبعد الظهر (53.3%) مع وجود دلالة إحصائية موسمية ونهارية، وقد حدثت معظم الحالات من الشتاء (54%) ومعظم الحالات كانت من النوع السلقي (62.4%) وكانت أغلب الحالات من الدرجة الشائية (62.4%) وكانت حالات الحروق في الشتاء (70.6%) وبعد الظهر (70.6%) مع وجود دلالة إحصائية موسمية ونهارية، وقد حدثت معظم الحالات من الشتاء (70.6%) ومعظم الحالات كانت من النوع السلقي (70.4%) وكانت أغلب الحالات من الدرجة الثانية (70.6%) وقد وجد أن الصدمة القلبية من الأسباب الأكثر شيوعاً للوفاة في حالات الحروق.

أن الأطفال دون سن 7 سنوات هم الأكثر تضررا، وكانت معظم الحوادث في المناطق الريفية وخلال فصل الشتاء. وكانت الحروق السلقية العارضة هي الأكثر شيوعًا، وكانت إصابة الذكور أكثر شيوعًا.