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ORIGINAL ARTICLE

Associated Factors of In-hospital Mortality in Adult Burn Patients: A Five-Year Retrospective Study

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Abstract: **Introduction:** Although comorbidities are recognized as important prognostic factors in burn patients, the impact of individual comorbidities and associated trauma on treatment outcomes has not been fully elucidated. This study aimed to evaluate the associations between individual comorbidities, the presence of comorbidities, associated trauma, and treatment outcomes in adult burn patients. **Methods:** A retrospective cohort study was conducted among all eligible adult burn patients (aged ≥18 years) admitted to Le Huu Trac National Burn Hospital, Vietnam, between January 2021 and December 2025. The primary outcome was in-hospital mortality. Demographic characteristics, burn characteristics, comorbidities, and associated trauma were extracted from the electronic medical records. Univariate and multivariate regression analyses were performed to identify factors independently associated with the study outcomes. **Results:** The study included 6653 adult burn patients with median age of 40 (interquartile range (IQR): 31 – 52) years (73.94% male). Among adult burn patients, hypertension and diabetes mellitus were the most common comorbidities (3.01% and 2.80%, respectively). The presence of comorbidities was an independent predictor of both complications and mortality (odds ratio (OR) = 1.926, 95% confidence interval (CI): 1.180–3.144, p = 0.009; and OR = 1.785, 95% CI: 1.057–3.014, p = 0.030, respectively), along with age, total burn size, full-thickness burn size, and inhalation injury (all p < 0.001). Chronic pulmonary disease (OR = 11.371, 95% CI: 2.972–43.498, p < 0.001) and paralysis (OR = 3.451, 95% CI: 1.085–10.976, p = 0.036) remained independent predictors of mortality. Associated trauma was independently associated with prolonged hospital stay (p = 0.033). **Conclusions:** Comorbidities were independently associated with both complications and mortality in adult burn patients. Chronic pulmonary disease and paralysis were identified as independent prognostic factors for mortality. Although associated trauma was not independently associated with mortality, it was independently associated with a prolonged hospital stay.

Keywords: Burns; Comorbidity; Mortality; Prognosis

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1. Introduction

Burn injury remains a major global public health concern. In 2021, approximately 6.19 million new thermal burn cases were reported worldwide, and more than 104 million people were living with burn-related sequelae. Although age-standardized incidence and mortality rates have declined over the past three decades, burn injuries continue to impose a substantial disease burden, particularly in countries with low socio-demographic development indices (1, 2). Recent studies have consistently demonstrated that increasing age, total burn size, full-thickness burn size, and inhalation injury remain independent factors associated with mortality in burn patients (3-6).

Several studies have reported that comorbidities and associated trauma are independent prognostic factors associated with an increased risk of complications and mortality, as well as prolonged hospital stay, even after adjustment for age, total burn size, full-thickness burn size, and inhalation injury (7, 8). In contrast, other studies have found no statistically significant association, or these variables were not included in multivariable analyses (9-12).

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The Charlson Comorbidity Index (CCI) and the Elixhauser Comorbidity Index (ECI) have been widely used to assess comorbidities in burn patients and have demonstrated prognostic value for treatment outcomes (7, 13, 14). However, the comprehensive application of either scoring system is not always feasible, particularly in healthcare facilities without integrated electronic health record systems. Furthermore, several common conditions, such as hypertension, are not included in the CCI. In addition, the effects of individual comorbidities and associated trauma on treatment outcomes in burn patients have not yet been fully clarified.

Therefore, further studies are needed to clarify the independent effects of individual comorbidities and associated trauma injuries on clinical outcomes in adult burn patients. We hypothesized that individual comorbidities and associated trauma injuries would be independently associated with adverse clinical outcomes. Accordingly, this study aimed to evaluate the associations between individual comorbidities, the presence of comorbidities, associated trauma injuries, and treatment outcomes in adult burn patients.

2. Methods

2.1. *Study design and setting*

This retrospective cohort study included all consecutive adult burn patients (aged ≥18 years) who met the eligibility criteria

and were admitted to Le Huu Trac National Burn Hospital, Vietnam, between January 2021 and December 2025. Patient selection is illustrated in Figure 1. The primary outcome was in-hospital mortality, while complications and length of hospital stay were evaluated as secondary outcomes.

This retrospective investigation adhered to the ethical principles outlined in the Declaration of Helsinki (1964). The study was approved by the Ethics Committee in Biomedical Research of the Le Huu Trac national burn hospital prior to initiation (No. 02/GCN-CTĐCNC, dated January 15, 2026).

2.2. *Participants*

Inclusion criteria: Adult burn patients (≥18 years) with a definitive hospital outcome (death during hospitalization or discharge after complete burn wound healing) were included.

Exclusion criteria: Patients who refused treatment, were transferred to another hospital during treatment, or had incomplete data required for the study were excluded.

2.3. *Data gathering*

Data were retrospectively extracted from the hospital's electronic medical record system. Following data collection, the dataset was assessed for completeness, consistency, and outliers. Duplicate records were removed, and missing or implausible values were verified against the original electronic medical records. After data cleaning, the dataset was coded and entered into statistical software for analysis. The study variables included: patient characteristics (age, sex, comorbidities, and associated trauma); pre-existing comorbidities diagnosed before hospital admission (included hypertension requiring ongoing antihypertensive therapy, heart failure, chronic pulmonary disease, diabetes mellitus, chronic kidney disease requiring maintenance medical therapy or regular dialysis, paralysis resulting in dependence for self-care, psychiatric disorders requiring maintenance medication, epilepsy, liver cirrhosis, and cancer); associated trauma (included traumatic brain injury (intracranial hemorrhage and intracranial hematoma), fractures (major fractures involving the pelvis, femur, lower leg, humerus, forearm, and ribs), ocular trauma (globe contusion), thoracic trauma (pleural effusion, hemothorax, pneumothorax, and pulmonary contusion involving ≥ 25% of the lung parenchyma), abdominal trauma (liver rupture and splenic rupture), and spinal trauma); and burn characteristics (burn etiology, total burn size, full-thickness burn size, and inhalation injury).

Total burn size was defined as the percentage of total body surface area (TBSA) burned. Full-thickness burn size was defined as the percentage of TBSA affected by full-thickness burns, as assessed by experienced burn surgeons at admission.

2.4. *Outcomes*

The primary outcome was in-hospital mortality. Patients were classified according to their final hospital outcome into two groups: non-survivors (patients who died during hospitalization) and survivors (patients who survived to hospital discharge). Complications (acute respiratory distress syndrome (ARDS), sepsis, septic shock, and multiple organ dysfunction syndrome (MODS)) and length of hospital stay were considered as secondary outcomes.

2.5. *Statistical analysis*

Statistical analyses were performed using Stata version 14.0. Quantitative variables were presented as mean ± standard deviation (SD) or median (interquartile range, IQR), as appropriate. Categorical variables were summarized as frequencies and percentages. Comparisons between groups were performed using the independent-samples t-test or Mann–Whitney U test for continuous variables and the χ^2 test or Fisher's exact test for categorical variables.

Univariable logistic regression was performed to evaluate the association between each covariate and the study outcomes. Variables with $p < 0.05$ in the univariable analysis were entered into a multivariable logistic regression model to identify independent predictors of the outcomes. Results are presented as odds ratios (ORs) with 95% confidence intervals (95% CIs). Two-sided p values <0.05 were considered statistically significant.

3. Results

3.1. *Baseline characteristics of studied patients*

The study included 6653 adult burn patients with median age of 40 (IQR: 31 – 52) years (73.94% male). Baseline characteristics of studied cases are presented in Table 1. The predominant burn etiology was dry thermal burns (56.50%). The median total burn size was 9% (IQR: 3 – 21%) total body surface area (TBSA), and the median full-thickness burn size was 0.5% (IQR: 0 - 3%) TBSA. A total of 300 (4.51%) patients sustained inhalation injury. The prevalence of comorbidities and associated trauma was 8.49% and 1.53%, respectively. Overall, 371 patients died, corresponding to an in-hospital mortality rate of 5.58%.

Hypertension and diabetes mellitus were the most common comorbidities (3.01% and 2.80%, respectively). Most patients with comorbidities had a single comorbid condition (74.87%), whereas only 4.6% had three or more comorbidities. The most common type of associated trauma was fracture (1.10%), and the majority of patients with associated trauma sustained only one associated injury (85.29%).

3.2. *Associated factors of in-hospital mortality and complications*

Univariate analysis demonstrated that age ($p < 0.001$ for both outcomes), burn etiology ($p < 0.001$ for both outcomes), total burn size ($p < 0.001$ for both outcomes), full-thickness burn size ($p < 0.001$ for both outcomes), inhalation injury ($p < 0.001$ for both outcomes), and the presence of comorbidities ($p = 0.032$ for complications and $p = 0.006$ for in-hospital mortality) were significantly associated with complications and in-hospital mortality (Table 2). In contrast, associated trauma was not significantly associated with complications or mortality ($p > 0.05$).

Multivariable analysis showed that the presence of comorbidities was an independent predictor of both complications and mortality (OR = 1.926, 95% CI: 1.180 – 3.144, p = 0.009; and OR = 1.785, 95% CI: 1.057 – 3.014, p = 0.030, respectively), together with age, total burn size, full-thickness burn size, and inhalation injury ($p < 0.001$) (Table 3). Kaplan–Meier survival analysis demonstrated that patients with comorbidities had a lower probability of in-hospital survival than those without comorbidities. The difference between the two survival curves was statistically significant according to the log-rank test ($\chi^2 = 7.31$, $p = 0.007$) (Figure 2).

Table 4 presents the analysis of different comorbidities and traumatic injuries in relation to in-hospital mortality. Hypertension, chronic

pulmonary disease, and paralysis were significantly associated with mortality among burn patients ($p < 0.05$). After adjustment for age, burn etiology, total burn size, full-thickness burn size, and inhalation injury, chronic pulmonary disease (OR = 11.371, 95% CI: 2.972 – 43.498, $p < 0.001$) and paralysis (OR = 3.451, 95% CI: 1.085 – 10.976, $p = 0.036$) remained independent predictors of mortality.

3.3. *Associated factors of prolonged length of hospital stay*

Among survivors, the presence of comorbidities was not associated with prolonged length of hospital stay ($p > 0.05$). In contrast, patients with associated trauma had a significantly longer hospital stay than those without associated trauma (25 (IQR: 14 – 42) days vs. 19 (IQR: 11 – 33) days, $p = 0.009$). Multivariable analysis further demonstrated that associated trauma was independently associated with prolonged hospital stay ($p = 0.033$), together with age, sex, total burn size, full-thickness burn size, and inhalation injury ($p < 0.001$) (Table 5).

4. Discussion

In this study, we evaluated the associations between the presence of comorbidities, individual comorbid conditions, associated traumatic injuries, and treatment outcomes in adult burn patients. We found that the presence of comorbidities was independently associated with increased risks of both in-hospital complications and mortality, even after adjustment for established burn prognostic factors. Among individual comorbidities, chronic pulmonary disease and paralysis were identified as independent predictors of mortality, with chronic pulmonary disease conferring the greatest risk. In contrast, although associated traumatic injuries were not independently associated with complications or mortality, they were associated with a prolonged hospital stay.

In the present study, 8.49% of patients had at least one comorbidity, which was lower than that reported in previous studies. Salehi et al. reported that 18.5% of 732 burn patients in Iran had comorbidities, with the prevalence increasing to 57% among patients aged ≥ 61 years (15). Similarly, Knowlin et al. reported that approximately 40% of 7,640 burn patients in the United States had at least one comorbidity (16). These differences may reflect variations in the age distribution of the study populations, epidemiological characteristics, and methods used to identify and record comorbidities. In developed countries, a higher proportion of elderly patients are hospitalized with burn injuries, resulting in a greater prevalence of chronic conditions such as hypertension, diabetes mellitus, and cardiovascular disease. In contrast, the majority of patients in our study were of working age (90.39%).

Although the prevalence of comorbidities was relatively low, the presence of comorbidities remained an independent prognostic factor for both complications and mortality in our study. This finding is consistent with previous reports. Thombs et al. (2007), in an analysis of 31,338 burn patients, demonstrated that pre-existing comorbidities significantly increased the risk of post-burn mortality and that incorporating comorbidities into prognostic models improved their predictive performance (11). In another study, comorbidities were found to significantly influence burn mortality across all age groups, particularly among younger burn patients. The risk of mortality increased linearly with the severity of comorbidities as measured by the Charlson Comorbidity Index (CCI) (OR: 1.59; 95% CI: 1.441 – 1.77; $p < 0.001$) (16). Additionally, age, total burn size, inhalation injury, and comorbidities have been identified as the most important variables to be incorporated into prognostic models for mortality in burn patients (13). Patients with two or more comorbidities have also been reported to have higher mortality rates and longer hospital stays (17).

Although comorbidities as a whole were independently associated with treatment outcomes, not all pre-existing conditions had the same impact on the prognosis of burn patients. Given the differences in pathophysiology and organ-specific effects among various diseases, evaluating individual comorbidities may help identify those that truly contribute to an increased risk of mortality. In our study, although hypertension, chronic pulmonary disease, and paralysis were all associated with mortality in the univariate analysis, only chronic pulmonary disease and paralysis remained statistically significant after adjustment for other prognostic factors. These findings suggest that mortality risk in burn patients depends not only on the number of comorbidities but also on the nature and severity of individual underlying diseases. A study conducted in Germany likewise reported that chronic obstructive pulmonary disease (COPD) was independently associated with mortality in burn patients (OR: 2.45; 95% CI: 1.38 – 4.35; $p = 0.002$) (17). This association may be explained by the reduced pulmonary reserve in patients with chronic lung disease, which increases the risk of pneumonia, acute respiratory distress syndrome (ARDS), and exacerbation of inhalation injury. However, a study published in 2025 found that COPD was not associated with prolonged hospital stay ($p = 0.060$), duration of mechanical ventilation ($p = 0.487$), or mortality (OR = 0.61; 95% CI: 0.24 – 1.53; $p = 0.297$) among patients with inhalation injury (18). This discrepancy may be attributable to the narrower study population, which was limited to patients with severe burns complicated by inhalation injury. Paralysis remained an independent predictor of mortality, possibly because these patients are bedridden or have reduced mobility, malnutrition, and impaired immune function, all of which increase the risk of infection and other burn-related complications.

Hypertension is one of the most common comorbidities among burn patients. It is associated with dysregulation of the sympathetic nervous system, activation of the renin–angiotensin–aldosterone system, endothelial dysfunction, and impaired vasodilation. Consequently, hypertension has been proposed to alter the hemodynamic response and adversely affect treatment outcomes in burn patients. Stephens et al. also reported that hypertension was associated with an approximately fivefold increase in the risk of in-hospital mortality among patients with severe burns (19). However, that study relied solely on univariate analysis and did not adjust for important confounding factors such as age, total burn size, full-thickness burn size, or inhalation injury. Therefore, hypertension could not be established as an independent prognostic factor. In contrast, in our study, hypertension was significantly associated with mortality only in the univariate analysis and lost statistical significance after adjustment for the established prognostic factors, suggesting that its apparent effect may primarily reflect older age and greater comorbidity burden rather than an independent contribution to mortality. Other studies have similarly reported that hypertension is not an independent predictor of mortality in burn patients (15, 20).

Associated trauma in burn patients has been proposed to produce a “two-hit” phenomenon, in which the inflammatory responses induced by burn injury and trauma act synergistically, thereby increasing injury severity and the risk of adverse outcomes (21). Burn patients with associated trauma have been

reported to have a higher mortality rate, particularly among those with minor burns, with an almost fivefold greater risk of death compared with patients sustaining burn injury alone (22). However, among patients with a total burn size ≥ 20%, associated trauma has not been shown to significantly influence injury severity (23). Our study included all adult burn patients, regardless of burn size. Accordingly, associated trauma was not significantly associated with complications or mortality. This finding may further support the notion that the prognosis of burn patients is primarily determined by age, total burn size, full-thickness burn size, and inhalation injury. Nevertheless, associated trauma was associated with a significantly longer hospital stay and remained an independent predictor of prolonged hospitalization. This may be explained by the fact that most associated injuries in our study were fractures (73/102). Definitive orthopedic management was generally deferred until the burn wounds had stabilized, followed by prolonged rehabilitation after fracture treatment.

Although this study was conducted at a single national burn referral center in Vietnam, the large sample size and inclusion of consecutive adult burn patients over a five-year period enhance the robustness of the findings. Nevertheless, differences in patient characteristics, healthcare systems, and burn management practices may limit the generalizability of our results to other settings. Therefore, external validation in multicenter cohorts and different populations is warranted before broader application of these findings.

4.1. *Limitations*

This study has several limitations. First, as a single-center retrospective study, it is inherently subject to information bias, and some potential confounding factors may not have been collected or adequately adjusted for. Second, although the overall sample size was large, the prevalence of comorbidities (8.49%) and associated trauma (1.53%) was relatively low. In particular, several individual comorbidities and types of associated trauma were uncommon, which may have reduced the statistical power to detect certain true associations. Third, the study evaluated only the presence of comorbidities and associated trauma without assessing the severity, duration, or level of disease control of individual comorbid conditions, all of which may influence treatment outcomes.

Despite these limitations, our study provides evidence from a large cohort of 6,653 adult burn patients, demonstrating that comprehensive assessment of comorbidities and associated trauma at the time of hospital admission may facilitate the early identification of patients at high risk of mortality and assist in predicting treatment needs and healthcare resource utilization, particularly among patients with chronic pulmonary disease, paralysis, or associated trauma. Further multicenter, prospective studies with larger sample sizes and more comprehensive assessments of comorbidity burden are warranted to validate and extend the findings of the present study.

5. Conclusions

Comorbidities were independently associated with both complications and mortality in adult burn patients, with chronic pulmonary disease and paralysis identified as independent prognostic factors for mortality. Although associated trauma was not associated with mortality, it was independently associated with a prolonged hospital stay. Comprehensive assessment of comorbidities and associated trauma at the time of hospital admission may facilitate risk stratification and optimize treatment strategies for adult burn patients.

6. Declarations

6.1. *Acknowledgments*

We would like to express our gratitude to all staff of the Intensive Care Unit, Le Huu Trac National Burn Hospital, Hanoi, for helping us collect data.

6.2. *Conflict of interests*

The authors declare no competing interest.

6.3. *Funding and supports*

This study received no financial support, and all authors declare no financial interests related to this work.

6.4. *Authors' contributions*

Hung Dinh Tran: Conceptualization, Methodology, Project administration, Data curation, Formal analysis, Writing – Original Draft. Hung Tuan Ngo: Conceptualization, Methodology, Project administration, Data curation, Formal analysis, Writing – Original Draft. Lam Nhu Nguyen: Conceptualization, Methodology, Project administration, Formal analysis, Writing – Review & Editing. Minh Le Nguyet Tran: Conceptualization, Methodology, Project administration, Formal analysis, Writing – Review & Editing. All authors read and approved the final version of the manuscript.

6.5. *Ethical statement*

This retrospective investigation adhered to the ethical principles outlined in the Declaration of Helsinki (1964) and was approved by the Clinical Research Ethics Committee of the Le Huu Trac National Burn Hospital, Hanoi, Vietnam.

6.6. *Informed consent*

I confirm the corresponding author has read the journal policies and submit this manuscript in accordance with those policies.

6.7. *Availability of supporting data*

All data and materials presented in this study are available from the corresponding author on reasonable request.

6.8. *Using artificial intelligence chatbots statement*

No artificial intelligence chatbots were used in the data analysis, model development, or writing of this manuscript.

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Table 1: Baseline characteristics of studied burn cases (n = 6653)

Variables	Values	Variables	Values
Age years)		**Comorbidity type**	
18 – 64	5998 (90.15)	Hypertension	200 (3.01)
65 and over	655 (9.85)	Heart failure	12 (0.23)
Median (IQR)	40 (31 – 52)	Chronic pulmonary disease	14 (0.21)
Gender		Diabetes mellitus	186 (2.80)
Male	4919 (73.94)	Chronic kidney disease	17 (0.26)
Female	1734 (26.06)	Paralysis	66 (0.99)
Total burn size (%TBSA)		Psychiatric disorders	50 (0.75)
< 30	5548 (83.39)	Epilepsy	156 (2.34)
30 – 49	578 (8.69)	Liver cirrhosis	11 (0.17)
50 – 79	379 (5.70)	Cancer	20 (0.30)
≥ 80	148 (2.22)	**Number of comorbidities**	
Median (IQR)	9 (3 – 21)	1	423 (74.87)
Full-thickness burn size (%TBSA)		2	116 (20.53)
< 10	5763 (86.62)	3	24 (4.25)
10 – 29	565 (8.49)	4	2 (0.35)
30 – 49	187 (2.81)	**Associated trauma**	
≥ 50	138 (2.07)	Traumatic brain injury	16 (0.24)
Median (IQR)	0.5 (0 – 3)	Bone fracture	73 (1.10)
Inhalation injury		Ocular injury	3 (0.05)
Yes	300 (4.51)	Pulmonary injury	14 (0.21)
Burn etiology		Abdominal injury	2 (0.03)
Flame burn	3759 (56.50)	Spinal injury	9 (0.14)
Scald burn	1317 (19.80)	**Number of injuries**	
Electricity burn	1378 (20.71)	1	87 (85.29)
Chemical burn	199 (2.99)	2	15 (14.71)
Comorbidity		**Mortality**	
Yes	565 (8.49)	Yes	371 (5.58)
Associated trauma			
Yes	102 (1.53)		

Data are presented as number (%) or median (IQR: Interquartile Range); TBSA: Total Body Surface Area.

Table 2: Univariate analysis of factors associated with complications and mortality in burn patients (n = 6653)

Outcomes	Variables	Coefficient	95% CI	P value
Complications	Age	0.014	0.007 – 0.022	< 0.001
	Gender	-0.159	-0.455 – 0.138	0.294
	Total burn size	0.065	0.060 – 0.070	< 0.001
	Full-thickness burn size	0.082	0.075 – 0.089	< 0.001
	Burn etiology	-0.669	-0.864 – (-0.473)	< 0.001
	Inhalation injury	3.736	3.445 – 4.027	< 0.001
	Comorbidity	0.423	0.037 – 0.809	0.032
	Associated trauma	-1.401	-3.374 – 0.573	0.164
Mortality	Age	0.018	0.012 – 0.024	< 0.001
	Gender	-0.071	-0.313 – 0.172	0.568
	Total burn size	0.087	0.081 – 0.094	< 0.001
	Full-thickness burn size	0.141	0.131 – 0.151	< 0.001
	Burn etiology	-0.845	-1.025 – (-0.665)	< 0.001
	Inhalation injury	4.542	4.247 – 4.836	< 0.001
	Comorbidity	0.452	0.131 – 0.774	0.006
	Associated trauma	-1.799	-3.772 – 0.173	0.074

CI: Confidence Interval.

Table 3: Multivariate logistic analysis for associated factors of complications and in-hospital mortality in burn patients

Outcomes	Variables	OR	95% CI	P value
Complications	Age	1.032	1.021 – 1.042	< 0.001
	Total burn size	1.049	1.039 – 1.058	< 0.001
	Full-thickness burn size	1.019	1.008 – 1.029	< 0.001
	Burn etiology	0.978	0.785 – 1.220	0.845
	Inhalation injury	3.032	1.972 – 4.662	< 0.001
	Comorbidity	1.926	1.180 – 3.144	0.009
	_cons	0.001	0.0006 – 0.003	< 0.001
Mortality	Age	1.059	1.047 – 1.072	< 0.001
	Total burn size	1.058	1.047 – 1.069	< 0.001
	Full-thickness burn size	1.074	1.058 – 1.089	< 0.001
	Burn etiology	0.909	0.714 – 1.157	0.438
	Inhalation injury	7.662	4.830 – 12.156	< 0.001
	Comorbidity	1.785	1.057 – 3.014	0.030
	_cons	0.0002	0.0001 – 0.0005	< 0.001

_cons: Constant; OR: Odds Ratio; CI: Confidence Interval.

Table 4: Univariate and multivariate analyses of the association between different comorbidities and traumatic injuries with in-hospital mortality

Variables	Univariate		Multivariate	
	Coef.	P value	OR (95% CI)	P value
Comorbidities				
Hypertension	0.875	< 0.001	1.958 (0.947 – 4.049)	0.070
Heart failure	0.961	0.207	NA	
Chronic pulmonary disease	1.922	0.001	11.371 (2.972 – 43.498)	< 0.001
Diabetes mellitus	0.483	0.071	NA	
Chronic kidney disease	NS		-	-
Paralysis	1.125	0.001	3.451 (1.085 – 10.976)	0.036
Psychiatric disorders	0.390	0.456	NA	-
Epilepsy	-0.822	0.107	NA	-
Liver cirrhosis	NS		-	-
Cancer	1.100	0.080	NA	-
Traumatic injuries				
Traumatic brain injury	NS		-	-
Bone fracture	-1.456	0.149	NA	-
Ocular injury	NS		-	-
Pulmonary injury	NS		-	-
Abdominal injury	NS		-	-
Spinal injury	NS		-	-
Other factors				
Age	0.018	<0.001	1.056 (1.044 – 1.069)	< 0.001
Total burn size	0.087	< 0.001	1.058 (1.047 -1.069)	< 0.001
Full-thickness burn size	0.141	< 0.001	1.074 (1.059 – 1.089)	< 0.001
Burn etiology	-0.845	< 0.001	0.905 (0.711 – 1.150)	0.412
Inhalation injury	4.542	< 0.001	7.709 (4.844 – 12.268)	< 0.001

NS: not significant; NA: Not Applicable. OR (95% CI): Odds Ratio (95% Confidence Interval); _cons: Constant; Coef.: Coefficient.

Table 5: Bivariate and multivariable analyses for associated factors of prolonged length of hospital stay (LOS) in burn patients

Parameter	N.	Bivariate		Multivariate	
		LOS (days)	P	Coef. (95% CI)	P
Age (year)					
18 – 64	5678	19 (11 – 34)	0.002	-0.077	< 0.001
65 and over	604	17 (11 – 30)		-0.109 – (-0.046)	
Gender					
Female	1642	17 (11 – 28)	< 0.001	-2.937	< 0.001
Male	4640	20 (12 – 35)		-4.050 – (-1.824)	
Total burn size (%TBSA)					
< 50	6040	18 (11 – 32)	< 0.001	3.767	< 0.001
≥ 50	242	53 (31- 75)		2.650 – 4.884	
Full-thickness burn size (%TBSA)					
< 30	6195	19 (11 – 33)	< 0.001	6.511	< 0.001
≥ 30	87	82 (55 – 100)		5.214 – 7.807	
Inhalation injury					
No	6194	19 (11 – 33)	< 0.001	-21.196	< 0.001
Yes	88	42.5 (17 – 67.5)		-24.099 – (-18.293)	
Comorbidity					
No	5763	19 (11 – 33)	0.264	NA	
Yes	519	20 (11 – 35)			
Associated trauma					
No	6181	19 (11 – 33)	0.009	4.246	0.033
Yes	101	25 (14 – 42)		0.353 – 8.140	
_cons				17.238	< 0.001
				15.360 – 19.116	

Data are presented as median (IQR: inter quartile range). N: number; 95% CI: 95% Confidence Interval; _cons: Constant; Coef.: Coefficient; LOS: length of hospital stay; NA: Not Applicable; IQR: Interquartile Range; TBSA: Total Body Surface Area.

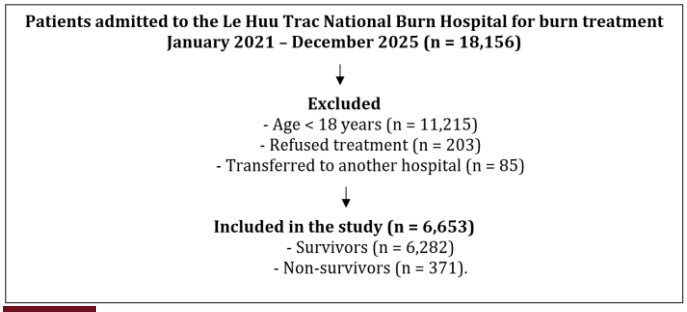

Figure 1: Flowchart of the study population selection.

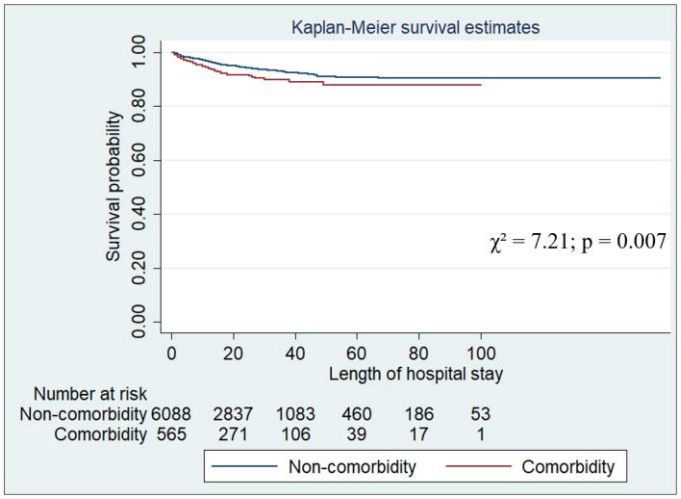

Figure 2: Kaplan–Meier curves for in-hospital survival stratified by comorbidity status.