中文題目：週末效應之探討：影響加護病房週末住院病人死亡率之可能因子

英文題目：Behind the weekend effect: factors affect the mortality rate in patients admitted to intensive care units in the weekends

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Background: Weekend effect, the mortality differences between weekend and weekday admissions to the intensive care units (ICU), had been reported with variable results in previous studies. Weekend effect is an important index to evaluate the care quality and stability of an ICU. We hypothesize that patients admitted to ICU on the weekends would have higher mortality rates compared to those admitted on the weekdays. In this single center study, we aimed to describe the characteristics of patients admitted to ICU on the weekends, and to determine the factors that affect the mortality rate in weekend admissions.

Methods: We retrospective screened 2678 cases admitted to the medical or surgical ICUs of Taipei Veterans General Hospital during December, 2015 to July, 2017. Readmissions to the ICU during the same hospital stay were considered as independent events. The patients were grouped as either weekday or weekend admission (admitted on weekend or holidays). The association of weekend admission and short-term mortality were analyzed. Moreover, we further interpreted the relationship between after-hours admission and short-term mortality.

Results: In 2678 cases of ICU admissions, holiday admissions consisted of 704 events (26.29 %). Patients admitted on weekends were with more cases referred from emergent department, and with higher APACHE II scores. Compared to those admitted on weekdays, patients admitted on weekends were significantly associated with higher 1-day (crude OR: 1.546, 95% CI: 1.084–2.205, p=0.016) and 30-days mortality (crude OR: 1.266, 95% CI: 1.052–1.524, p=0.013). However, the difference was not more significant after adjusting APACHE II scores, cause of ICU admission, and hemodynamic parameters. In addition, there was no significant difference between the mortality rates among patients admitted to ICU on the daytime hours or after hours.

Conclusion: Patients admitted to ICU on the weekends are associated with greater mortality risk. However, the difference of mortality, so called weekend effect, is mainly caused by the difference of disease severity rather than the variation of ICU care quality.

Keywords: weekend; holiday; afterhours; mortality; intensive care units

Table 1. Baseline characteristics of patients grouped by weekday or weekend admission

	Total	Weekday	Weekend	*P* value
	N=2678	N=1974	N=704	
Age (years)	67.09 ± 17.36	66.77 ± 17.16	68.0 ± 17.9	0.107
Male gender	1739 (64.9)	1275 (64.6)	464 (65.9)	0.529
Body mass index	23.6 ±4.75	23.8 ±4.73	23.0 ±4.7	0.001
APACHE II scores	24.64 ± 8.69	24.35 ±8.70	25.4 ±8.6	0.009
Admission time and source				
Admitted / transferred from				
Emergency department	1279 (47.8)	895 (45.3)	384 (54.5)	<0.001
Ward	1263 (47.2)	962 (48.7)	301 (42.8)	
Admission time				
Daytime hours	1296 (48.4)	970 (49.1)	326 (46.3)	0.197
Afterhours	1382 (51.6)	1004 (50.9)	378 (53.7)	
Cause of ICU Admission				
Acute respiratory failure	977 (36.5)	688 (34.9)	289 (41.1)	<0.001
Hemodynamic instability	676 (25.2)	448 (22.7)	228 (32.4)	
Major surgery/ PCI	654 (24.4)	528 (26.7)	126 (17.9)	
Others	371 (13.9)	310 (15.7)	126 (17.9)	
Comorbidities				
Hypertension	1305 (48.7)	991 (50.2)	314 (44.6)	0.011
Diabetic mellitus	913 (34.1)	667 (33.8)	246 (34.9)	0.579
Coronary artery disease	444 (16.6)	326 (16.5)	118 (16.8)	0.880
Heart failure	299 (11.2)	215 (10.9)	84 (11.9)	0.452
COPD	145 (5.4)	99 (5.0)	46 (6.5)	0.126
Cirrhosis	217 (8.1)	161 (8.2)	56 (8.0)	0.866
Malignancy (solid tumor)	787 (29.4)	588 (29.8)	199 (28.3)	0.447
Hemodynamics status				
Sepsis	1262 (47.1)	859 (43.5)	403 (57.2)	<0.001
Mean arterial pressure (mmHg)	62.8 ±15.3	63.1 ±15.4	62.0 ±15.0	0.117
Inotrope/ vasopressor usage	896 (33.5)	607 (30.7)	289 (41.1)	<0.001
Initial lactate (mg/dL)	25.8 ±29.3	25.4 ±28.9	26.7 ±30.3	0.375
Lab data				
White blood cells (K)	12.2 ±13.0	12.2 ±14.3	12.4 ±8.6	0.787
Hemoglobin (mg/dL)	9.8 ±2.3	9.9 ±2.3	9.7 ±2.2	0.132
Platelet (K)	163.1 ±104.7	164.0 ±104.7	160.4 ±104.7	0.459
Initial eGFR (mL/min/1.73 m2)	41.7 ±26.4	42.1 ±26.5	40.7 ±26.3	0.300
Albumin (mg/dL)	2.9 ±0.6	2.9 ±0.6	2.9 ±0.6	0.321
Glucose (mg/dL)	178.7 ± 84.5	178.1 ± 83.5	180.3 ± 87.1	0.241
HbA1C	6.77 ± 1.62	6.74 ± 1.60	6.85 ± 1.68	0.380

Figure 1. Kaplan-Meier curves of freedom from mortality events in patients grouped by admissions on weekends or weekdays