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Introduction

- Continuous Renal Replacement Therapy (CRRT) is essential for critically ill patients with acute kidney injury.
- The timing of initiation can influence survival.
- Off-Hour initiation may lead to delays due to related the resources and staffing.

Objective

To compare the clinical outcomes of patients who initiated CRRT during in-hours versus off-hours in an intensive care setting.

Materials and Methods

- This is a single center retrospective of critical care patients who need CRRT in King Chulalongkorn Memorial Hospital , Bangkok , Thailand.
- The timeframe of data collection was between December 2022 to January 2025.
- Patients were categorized into two groups based on the time of RRT initiation : In-hours group was 6 a.m. until 4 p.m. and Off-hours group was 4 p.m. until 6 a.m.
- Following data were collected and compared between groups: demographics characteristics, illness severity scores, day of RRT initiation, ICU length of stay, hospital length of stay, 28-day mortality, in-hospital mortality, and dialysis dependence at discharge.

Results

- There were 326 patients who initiated RRT in-hours group compared to 224 patients in the off-hours group.
- The 28-day mortality rate was significantly lower in the in-hours group (35.3%) compared to the off-hours group (51.8%, *p* < 0.001).
- Patients in the in-hours group also had significantly lower illness severity scores. The mean SOFA score was 9.99 in the in-hours group versus 12.04 in the off-hours group (*p* < 0.001), and the mean APACHE II score was 17.9 versus 20.8, respectively (*p* < 0.001).
- In-hospital mortality was also lower in the in-hours group (48.2%) compared to the off-hours group (59.8%), with a borderline statistical significance (*p* = 0.051).

Table 1 : Baseline Characteristics

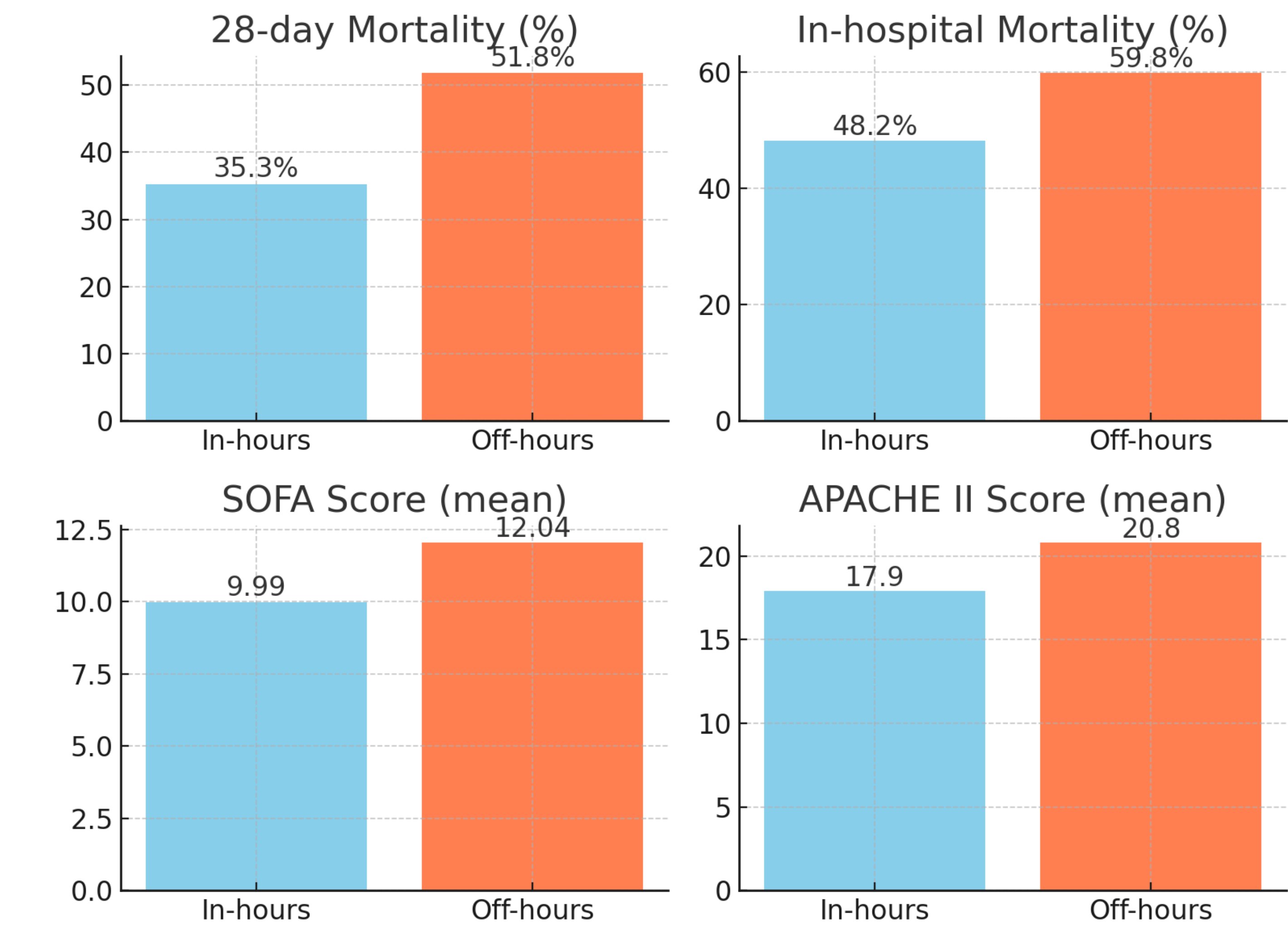
| Characteristics | In-hours | Off-hours | P-value |
|---------------------------|-------------|-------------|---------|
| | N=326 | N=224 | |
| Age | 64 | 61 | 0.074 |
| Male | 181 | 138 | 0.16 |
| ICU | | | 0.3 |
| • MICU | 158 | 124 | |
| • CCU | 51 | 40 | |
| • CVT | 37 | 26 | |
| • SICU | 60 | 26 | |
| • NSICU | 11 | 3 | |
| • EID ICU | 1 | 1 | |
| • Missing | 8 | 4 | |
| AKI | 202 | 182 | <0.001 |
| Cause of AKI | | | |
| • Ischemic | 112 (34.4%) | 98 (43.8%) | 0.026 |
| • Multifactorial | 150 (46%) | 109 (48.7%) | 0.54 |
| • Nephrotoxic | 30 (9.2%) | 19 (8.5%) | 0.77 |
| • Septicemia | 121 (37.1%) | 87 (38.8%) | 0.68 |
| Severity | | | |
| • SOFA | 9.99 | 12 | <0.001 |
| • APACHE II | 17.99 | 20.84 | <0.001 |
| Outcome | | | |
| • 28 days mortality | 115 (35.3%) | 116 (51.8%) | <0.001 |
| • Hospital length of stay | 36.85 | 27.99 | <0.008 |
| • ICU length of stay | 16.65 | 12.92 | 0.043 |
| • RRT day | 7.45 | 7.84 | 0.64 |

Discussion

- The 28-day mortality was significantly lower in the in-hours group compared with the off-hours group.
- Patients in the in-hours group had lower illness severity (SOFA and APACHE II scores), which may partly explain the outcomes.
- In-hospital mortality showed a consistent trend, though only borderline significant.
- Timing, staffing availability, and limited resources during off-hours may contribute to worse outcomes.
- Further prospective studies are needed to determine whether system-level interventions (e.g., staffing models, standardized RRT protocols) can reduce this disparity.

Conclusion

Initiating CRRT during in-hours was associated with significantly lower 28-day mortality and in-hospital mortality, as well as lower severity scores. These findings suggest that earlier and well-resourced CRRT initiation during regular working hours may lead to better clinical outcomes.



Acknowledgement

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