

# An analysis of critical illness scores among patients admitted to intermediate care units (IMCUs) at a tertiary care hospital in Karachi, Pakistan

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## Introduction

Intermediate care units (IMCUs) can act as 'step-up' units for patients who are admitted from the emergency department to these units instead of general wards, and can act as 'step-down' units for critically ill patients who were admitted in intensive care units.<sup>1,2</sup> In lower- and lower/middle-income countries (LMICs) like Pakistan, intensive care units (ICUs) are often limited and many times patients are admitted to IMCUs or high-dependency units (HDUs).<sup>3</sup> Most research on prognostication of acute medical conditions has been done in ICUs and not in IMCUs.<sup>4</sup> Hence, scoring systems for prognostication of such patients in IMCUs are absolutely essential.

The main aim of this study was to compare four critical illness scores, including the Acute Physiology and Chronic Health Evaluation II (APACHE II), Sequential Organ Failure Assessment (SOFA) and Simplified Acute Physiology Score II (SAPS II) and Modified Early Warning Score (MEWS), of acutely ill patients admitted to IMCU and compare the predictive accuracy of these four scoring systems in predicting mortality in patients.

## Material and methods

This was a comparative cross-sectional study on patients aged  $\geq 18$  admitted to the IMCU of Aga Khan University Hospital from 2017–2019. All patients admitted to IMCU from the emergency room were included in the study. Patients' records were reviewed for demographic data, physiological and laboratory parameters.

Mean and standard deviation (SD) were used as quantitative variable, and frequency and percentage as categorical variable. Median score and interquartile range (IQR) for each severity score was calculated, due to their skewed distribution. Comparison between survivors and non-survivors were made using a two-sample T-test. Logistic regression analysis was also used to assess the relationship between different patient-related variables and in-hospital mortality. The statistical methods were verified, assuming a significance level of  $p < 0.05$ .

**Table 1. Comparison of critical illness scores overall, among survivors and non-survivors in patients admitted to IMCU**

Critical illness scale	Overall (n = 923)	Survived (n = 864)	Not survived (n = 59)	p
APACHE II, median (IQR)	16 (11–21)	16 (11–21)	20 (13–25)	0.002
SOFA, median (IQR)	4 (2–6)	4 (2–5)	7 (4–10)	0.000
SAPS II, median (IQR)	36 (30–43)	35 (30–42)	44 (38–53)	0.000
MEWS, median (IQR)	3 (2–4)	3 (2–4)	5 (3–6)	0.000

## Results

A total of 1,192 patients were admitted to the IMCU, for 923 of whom (77.4%) medical records were finally analysed. The mean (SD) age of participants was 62 years ( $\pm 16.5$ ), and 469 (50.8%) were women. The overall hospital mortality of patients managed in IMCU was 6.4% (59/923 patients). The median scores of APACHE II, SOFA, SAPS II and MEWS were 16 (IQR 11–21), 4 (IQR 2–6), 36 (IQR 30–53) and 3 (IQR 2–4) points respectively. (See Table 1.)

Area under the curve (AUC) for SAPS II was 0.742 (95% confidence interval (CI): 0.67–0.80), for SOFA it was 0.720 (95% CI: 0.64–0.79) and for MEWS it was 0.718 (95% CI: 0.67–0.80). The lowest AUC was 0.62 (95% CI: 0.50–0.65) for APACHE II (Fig 1).

## Conclusion

In conclusion, our study found that SAPS II, followed by SOFA and MEWS scores, provided better discrimination in stratifying critical illness in patients admitted to the IMCU of a tertiary care hospital in Pakistan. ■

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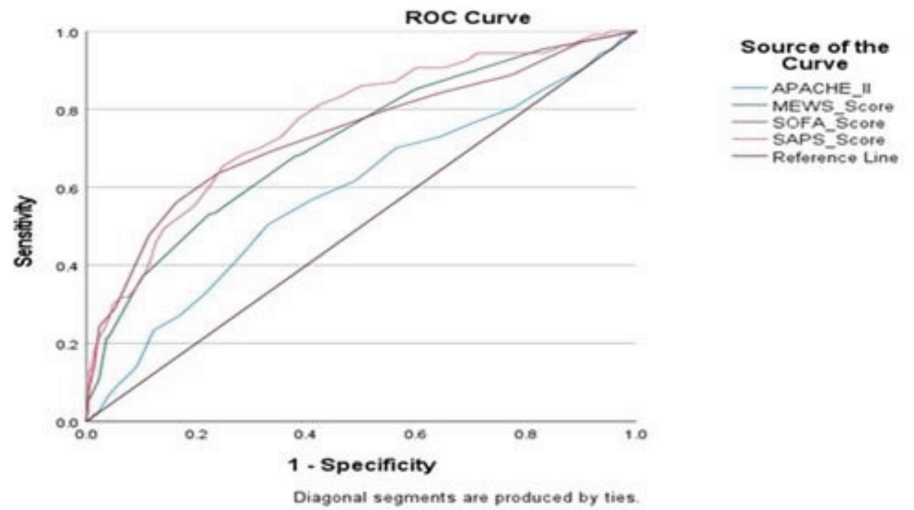


Fig 1. ROC curve of four different scoring system in patients admitted to IMCU.

## References

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