



(RESEARCH ARTICLE)



EVALUATING PATIENT HEALTH OUTCOMES IN ONCOLOGY PATIENTS TRANSFERRED TO CRITICAL CARE FOLLOWING PRE-MET ASSESSMENT AND MET CALL ACTIVATION

Deepa P^{1,*}, Kalaimani M¹, Ranjitham Anderson¹ and Mangala Chatterjee²

¹ Department of Nursing, Apollo Specialty Hospitals, Teynampet, Chennai, India.

² Department of Nursing Apollo Multispeciality Hospitals, Kolkata, India.

ORCID Details

Deepa P: <https://orcid.org/0009-0000-9492-050X>

Ranjitham Anderson: <https://orcid.org/0000-0003-3185-7632>

Mangala Chatterjee: <https://orcid.org/0009-0000-8912-4519>

International Journal of Science and Research Archive, 2026, 20(03), 900–908

Publication history: Received on 15 August 2026; revised on 20 September 2026; accepted on 22 September 2026

Article DOI: <https://doi.org/10.30574/ijrsra.2026.20.3.1781>

Copyright © 2026 Author(s) retain the copyright of this article. This article is published under the terms of the Creative Commons Attribution License 4.0

ABSTRACT

Background: Early recognition of clinical deterioration is essential in oncology patients because of the complex nature of cancer, treatment-related complications, and associated comorbidities. Hospitals utilize escalation pathways such as Pre-Medical Emergency Team (Pre-MET) assessments and Medical Emergency Team (MET) call activations to facilitate timely intervention and transfer to critical care. However, limited evidence exists regarding the comparative effectiveness of these pathways in oncology patients.

Aim: To evaluate and compare the effectiveness of Pre-MET assessment and MET call activation in improving health outcomes among oncology patients transferred to the Critical Care Unit (CCU).

Methods: A retrospective comparative observational study was conducted at Apollo Cancer Centre, Teynampet. The study included 365 adult oncology patients transferred to the CCU between January 2024 and December 2024 through either Pre-MET assessment (n=195) or MET call activation (n=170). Clinical outcomes evaluated included mortality, CCU length of stay, requirement for mechanical ventilation, and 30-day readmission. Descriptive and inferential statistics, including Chi-square and Mann-Whitney U tests, were used for analysis with statistical significance set at $p < 0.05$.

Results: Among the 365 patients studied, the mean CCU length of stay was significantly higher in the pre-MET group (6.01 days) compared with the MET group (3.21 days) ($p < 0.001$). Mechanical ventilation was required more frequently among Pre-MET patients (56.4%) than MET patients (40.6%), demonstrating a statistically significant association ($p = 0.004$). Mortality rates were lower in the pre-MET group (35.4%) than the MET group (43.5%), but the difference was not statistically significant ($p = 0.138$). Similarly, 30-day readmission rates were lower among Pre-MET patients (10.8%) compared with MET patients (13.5%), although the difference was not statistically significant ($p = 0.518$).

Conclusion: The Pre-MET pathway was associated with numerically lower mortality and readmission rates compared to MET activation, although these differences were not statistically significant. Significant differences were observed in CCU length of stay and mechanical ventilation requirements between the two escalation pathways. These findings highlight the importance of early deterioration recognition and emphasize the need for larger multicenter studies to further evaluate the impact of Pre-MET interventions on oncology patient outcomes.

Keywords: Pre-MET Assessment, Medical Emergency Team, Oncology Patients, Critical Care Unit, Mortality, Mechanical Ventilation, Length of Stay, Readmission.

1 INTRODUCTION

In oncology hospitals, patients often require chronic care and close observation due to the complexity of cancer, treatment-related complications, and comorbidities. Timely identification of clinical deterioration and appropriate escalation of care is essential to improving patient outcomes and reducing mortality.

To address this, many hospitals have implemented early warning systems such as the Pre-Medical Emergency Team (Pre-MET) assessments and Medical Emergency Team (MET) call activations. Pre-MET assessments typically involve the proactive identification of patients showing early signs of physiological decline, often guided by early warning scores like MEWS (Modified Early Warning Score). In contrast, MET calls are reactive responses to acute patient deterioration requiring immediate intervention by a specialized team.

While both pathways aim to prevent adverse outcomes and facilitate timely transfer to the Critical Care Unit (CCU), evidence on their comparative effectiveness in oncology patients remains limited, as their clinical trajectories may differ significantly from those of general medical patients. Oncology patients may deteriorate more rapidly depending on treatment-related toxicities, infection risk, and tumour burden, necessitating tailored evaluation of escalation protocols.

This retrospective study compares the effectiveness of Pre-MET assessments versus MET call activations influencing health outcomes of oncology patients transferred to the CCU. By focusing on metrics such as mortality, length of stay, need for ventilatory support, and time to intervention, this research seeks to contribute valuable insights into optimizing care pathways for a highly vulnerable patient population.

Table 1: MET Activation criteria and Pre-MET Criteria

MET Activation Criteria	Pre-MET Criteria
Respiration- All Respiratory Arrest Respiratory Rate <8/Min Respiratory Rate >30/Min Oxygen Saturation <90% (On 6 LMP Oxygen) Stridor, Upper airway Obstruction/ Threatened Airway Hemodynamic – All cardiac Arrest Systolic BP <90mm.Hg Systolic BP >200 mm.Hg. Pulse Rate <40/min Pulse Rate >130/min. Neurological Status- Sudden Decrease in consciousness level (Fall of GCS of more than 2) Repeated or Prolonged Seizures.	Pre-MET is used when a patient shows early clinical deterioration but does not yet meet the full MET criteria. Increasing respiratory rate or work of breathing New oxygen requirement or increasing oxygen requirement Drop in SpO ₂ despite oxygen therapy Persistent tachycardia or abnormal heart rate New hypotension or falling blood pressure Altered mental status or new confusion Reduced urine output Significant change in MEWS/early warning score Clinical concern by nurse/doctor despite relatively stable vital signs Any patient who appears to be deteriorating and may require critical-care intervention

Objectives:

- To assess the clinical outcomes (e.g., mortality, length of CCU stay, need for mechanical ventilation) of oncology patients transferred to the CCU following Pre-MET assessment.
- To assess the clinical outcomes of oncology patients transferred to the CCU following MET call activation.

- To compare the effectiveness of pre-MET assessment versus MET call activation in improving health outcomes of oncology patients.

1.1 Research Hypothesis

There will be a significant difference in patient health outcomes between oncology patients who will be transferred to the Critical Care Unit following pre-MET assessment and those who will be transferred following MET call activation.

1.2 Assumptions of the Study

The study is based on the following assumptions:

- The information documented in the hospital for electronic medical records and CCU databases is accurate, complete, and reliable.
- All Pre-MET assessments and MET activations were conducted according to the hospital's established escalation protocols.
- Patients included in the study were appropriately categorized into Pre-MET and MET groups based on documented escalation pathways.
- Clinical outcomes such as mortality, length of stay, mechanical ventilation requirement, and 30-day readmission were accurately recorded in patient records.
- Variations in clinical management among healthcare providers did not significantly influence the overall comparison between the Pre-MET and MET groups.
- The selected outcome variables adequately reflect the effectiveness of early recognition and escalation of clinical deterioration.

1.3 Delimitations of the Study

The study is limited to the following boundaries:

- The study includes only adult oncology patients (≥ 18 years) who were transferred to the Critical Care Unit through either Pre-MET assessment or MET activation.
- Data are restricted to patients admitted January 2024 to December 2024.
- The study is conducted in a single tertiary care oncology hospital, limiting generalizability to other healthcare settings.
- Patients admitted directly from the Emergency Department, Operating Theatre, or those receiving end-of-life/palliative-only care are excluded from the study.
- The study uses a retrospective observational design and relies on existing medical records without direct patient follow-up.
- Disease severity scores, cancer staging, treatment regimens, and other potential confounding variables are not included in the primary analysis unless separately documented.
- The findings are intended to compare outcomes between pre-MET and MET pathways and do not establish a causal relationship between escalation pathways and patient outcomes.

2 RESEARCH METHODOLOGY

2.1 Research Approach

Quantitative research approach

2.2 Research Design

Retrospective comparative observational research design

2.3 Research Setting

The study conducted at Apollo Cancer Centre, Chennai, a tertiary care oncology Centre equipped with specialized oncology services, Medical Emergency Team (MET) services, and Critical Care Units (CCU).

2.4 Study Population

The target population comprises all adult oncology patients admitted to Apollo Cancer Centre who required escalation of care and subsequent transfer to the Critical Care Unit (CCU) through either Pre-MET assessment or MET call activation during the study period.

2.5 Sample

The study sample consists of all eligible oncology patients who met the inclusion criteria during the study period from January 2024 to December 2024

2.6 Sample Size

Table 2: Group-wise Distribution of Study Participants

Group	Number of Patients
Pre-MET Group	195
MET Group	170
Total Sample Size	365

2.7 Sampling Technique

A non-probability total enumeration sampling technique

2.7.1 Inclusion Criteria

- Adult oncology patients aged ≥ 18 years.
- Patients transferred to CCU through Pre-MET assessment.
- Patients transferred to CCU following MET call activation.
- Patients admitted from January 2024 to December 2024.
- Availability of complete medical records required for data collection.

2.7.2 Exclusion Criteria

- Patients admitted directly to CCU from the Emergency Department.
- Patients admitted directly from the Operating Theatre.
- Patients with incomplete medical records.
- Patients below 18 years of age.

2.8 Conceptual Framework

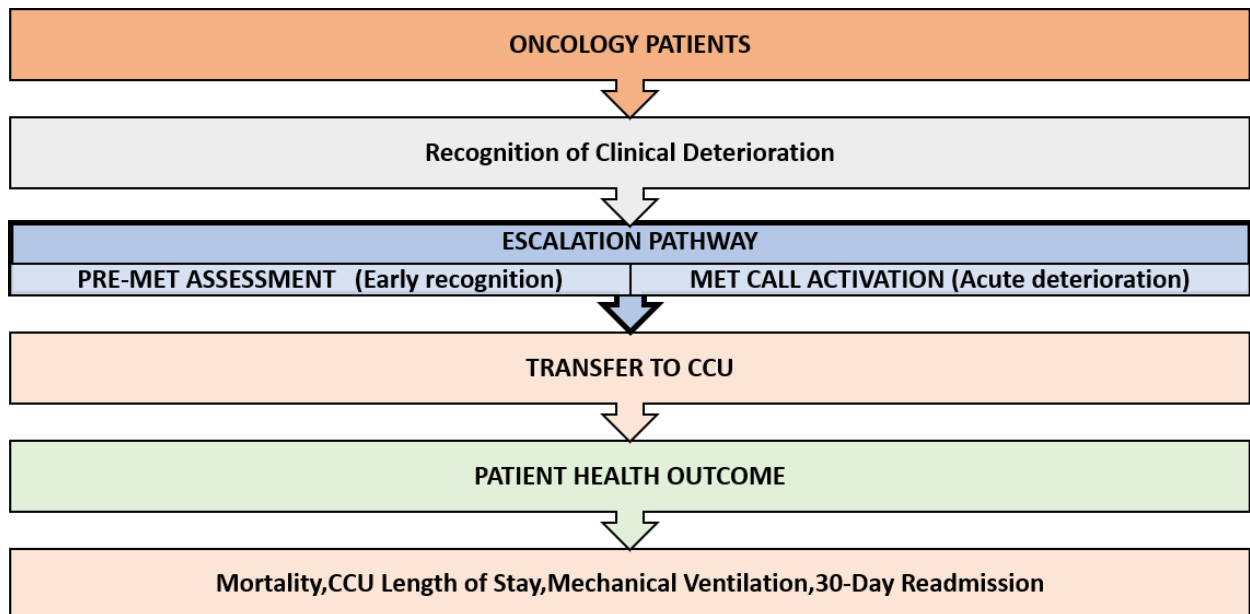


Figure 1: Conceptual Framework of the Pre-MET and MET Activation Pathway in Oncology Patients

2.9 Research Variables

Independent Variable: Mode of escalation to CCU

- Pre-MET Assessment
- MET Call Activation

Dependent Variables

- Mortality
- Length of CCU Stay
- Mechanical Ventilation Requirement
- 30-Day Readmission

2.10 Operational Definition of Variable

Table 3: Operational Definition of Variables

	Operational Definition	Measurement Scale
Pre-MET Assessment	Early clinical deterioration identified before MET activation	Categorical
MET Call Activation	Emergency team activation due to significant physiological deterioration	Categorical
Mortality	Patient death during hospitalization	Nominal (Yes/No)
Length of Stay	Number of days spent in CCU	Continuous
Mechanical Ventilation	Requirement of invasive mechanical ventilation during CCU stay	Nominal (Yes/No)
30-Day Readmission	Readmission to hospital within 30 days following discharge	Nominal (Yes/No)

2.11 Data Collection Procedure

Institutional Ethical Committee approval was obtained prior to the commencement of the study. Patient records were retrieved from the Hospital Information System (HIS), MET database, and CCU records. The retrieved records were screened according to the predefined inclusion and exclusion criteria. Relevant data were extracted using a structured data collection tool. The data collected were coded and entered Microsoft Excel and subsequently analyzed using appropriate statistical software

2.12 Data Analysis and Interpretation

Data was analyzed in accordance with the objectives of the study and formulated hypotheses. Both descriptive and inferential statistics were used for data analysis.

3 RESEARCH RESULTS

Based on the MET & Pre-MET 2024 Analysis dataset, the following frequency distribution can be used in the Results section of your research paper. The length of stay (LOS) has been categorized into clinically meaningful groups.

Table 4: Distribution of CCU Length of Stay among Pre-MET Patients & MET Patients

LOS Category	Pre-MET n (%)	MET n (%)
≤3 Days	93 (47.7%)	117 (68.8%)
4-7 Days	65 (33.3%)	31 (18.2%)
8-14 Days	29 (14.9%)	16 (9.4%)
>14 Days	8 (4.1%)	6 (3.5%)
Total	195 (100%)	170 (100%)

Among the 195 Pre-MET patients, 47.7% had a CCU stay of 1–3 days, 33.3% stayed for 4–7 days, 14.9% for 8–14 days, and 4.1% for more than 14 days. Among the 170 MET patients, 68.8% had a stay of ≤ 3 days, 18.2% stayed for 4–7 days, 9.4% for 8–14 days, and 3.5% for more than 14 days. Overall, MET patients had shorter CCU stays, while Pre-MET patients had a significantly higher mean CCU length of stay (6.01 vs. 3.21 days, $p < 0.001$).

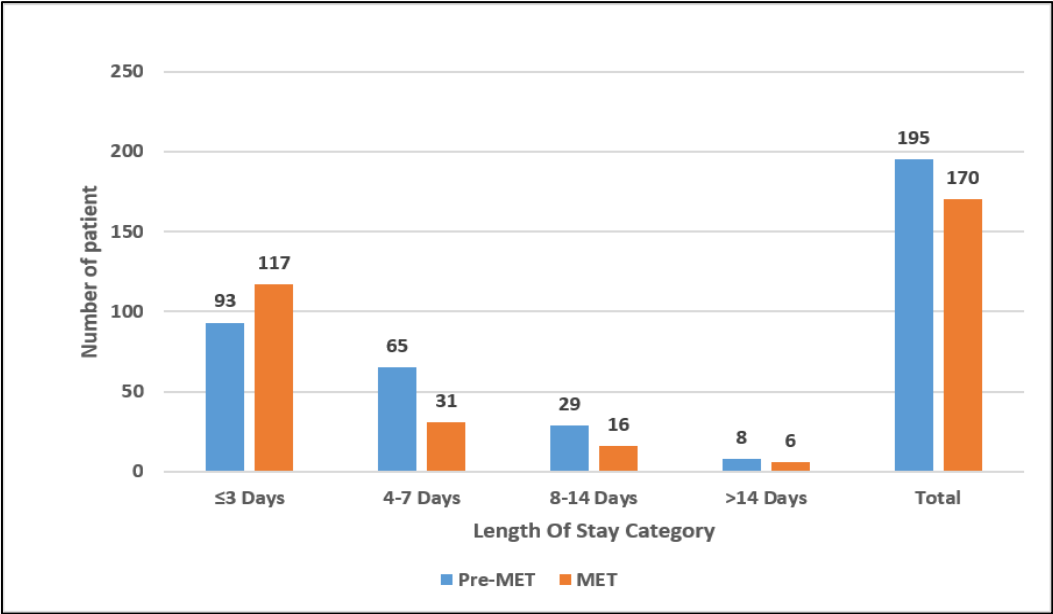


Figure 2: Distribution of CCU Length of Stay among Pre-MET Patients & MET Patients

Table 5: Frequency and Percentage of 30-Day Readmissions among Pre-MET and MET Patients

Readmission within 30 Days	Pre-MET (n=195)	MET (n=170)	χ^2	p
Yes	21 (10.8%)	23 (13.5%)	$\chi^2 = 0.42$	0.518 Not Statistically Significant
No	174 (89.2%)	147 (86.5%)		
Total	195 (100%)	170 (100%)		

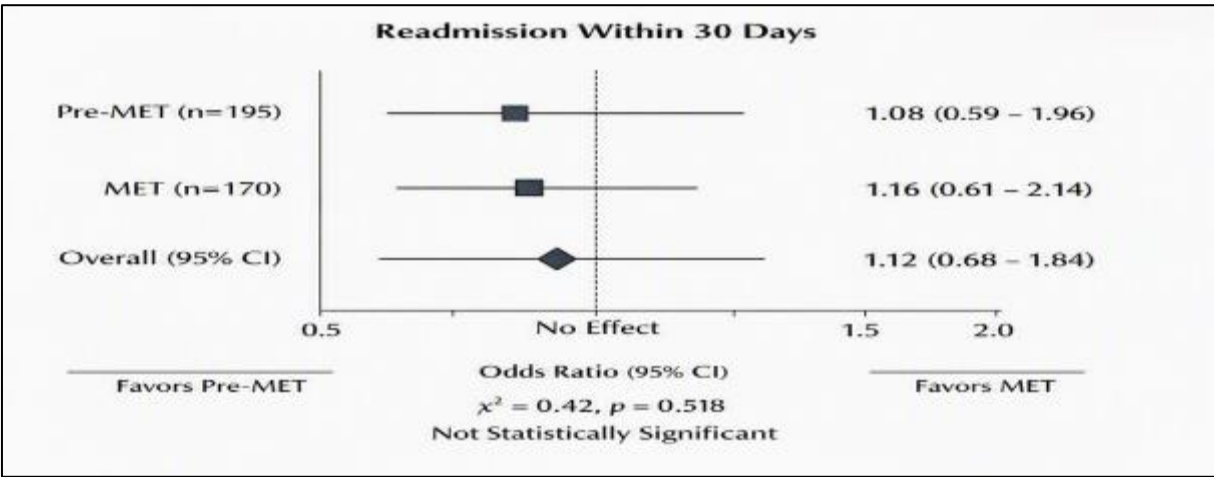


Figure 3: Comparison of readmission within 30 days

Based on the 2024 dataset, readmission was defined as any patient with one or more readmissions within 30 days. Among 195 patients in the Pre-MET pathway, 21 (10.8%) were readmitted, while 174 (89.2%) were not. In the MET group, 23 of 170 patients (13.5%) were readmitted, and 147 (86.5%) were not. Although the Pre-MET group had a numerically lower readmission rate (10.8% vs. 13.5%), Chi-square analysis ($\chi^2 = 0.42, p = 0.518$) showed no statistically

significant difference. Thus, the escalation pathway (Pre-MET vs. MET) was not significantly associated with 30-day readmission rates.

Table 6: Mortality among Pre-MET and MET Patients

Mortality Status	Pre-MET (n=195)	MET (n=170)	χ^2 Value	p-value
Died	69 (35.4%)	74 (43.5%)	2.20	0.138 Not Statistically Significant
Survived	126 (64.6%)	96 (56.5%)		
Total	195 (100%)	170 (100%)		

Mortality was observed in 35.4% of Pre-MET patients and 43.5% of MET patients. Although the mortality rate was lower in the Pre-MET group, the difference was not statistically significant ($\chi^2 = 2.20$, $p = 0.138$). Therefore, there is insufficient evidence to conclude that the mode of escalation (Pre-MET vs. MET) had a significant effect on mortality outcomes in this study.

Table 7: Requirement of Mechanical Ventilation among Pre-MET and MET Patients

Mechanical Ventilation	Pre-MET (n=195)	MET (n=170)	χ^2 Value	p-value
Required	110 (56.4%)	69 (40.6%)	8.49	0.004 Statistically Significant
Not Required	85 (43.6%)	101 (59.4%)		
Total	195 (100%)	170 (100%)		

Mechanical ventilation was required in 110 (56.4%) patients in the Pre-MET group and 69 (40.6%) patients in the MET group. Chi-square analysis demonstrated a statistically significant association between the escalation pathway and the requirement for mechanical ventilation ($\chi^2 = 8.49$, $p = 0.004$).

Table 8: Comparison of Clinical Outcomes

Outcome Variable	Pre-MET (n=195)	MET (n=170)	p-value	Interpretation
Length of Stay (days), Mean	6.01	3.21	<0.001	Statistically Significant
30-day Readmission Rate	10.8%	13.5%	0.518	Not Significant
Mortality Rate	35.4%	43.5%	0.138	Not Significant
Mechanical Ventilation Required	56.4%	40.6%	0.004	Statistically Significant
Significance level: $p < 0.05$				

A total of 365 oncology patients were included, with 195 in the Pre-MET group and 170 in the MET group. The mean CCU length of stay was significantly longer in the Pre-MET group (6.01 vs. 3.21 days, $p < 0.001$). The 30-day readmission rate was lower in Pre-MET patients (10.8% vs. 13.5%), though not statistically significant ($p = 0.518$). Mortality was 35.4% in Pre-MET and 43.5% in MET, also not significant ($p = 0.138$). Mechanical ventilation was required more often in Pre-MET patients (56.4% vs. 40.6%), showing a significant difference ($p = 0.004$).

4 DISCUSSION OF FINDINGS

The present study demonstrated significant differences between the Pre-MET and MET groups in CCU length of stay and mechanical ventilation. Pre-MET patients had a significantly longer mean CCU stay (6.01 vs. 3.21 days, $p < 0.001$) and a higher requirement for mechanical ventilation (56.4% vs. 40.6%, $p = 0.004$). These findings may reflect differences in clinical acuity and the early identification of patients requiring prolonged critical care rather than a direct adverse effect of the Pre-MET pathway.

Bachmann et al. (2025) highlighted the importance of timely MET activation in oncology and non-oncology patients, supporting the role of early recognition and prompt escalation in deteriorating patients. Donnelly et al. (2024) similarly emphasized the important role of ward nurses in recognizing clinical deterioration and initiating timely responses. Tan et al. (2023) reported that patients identified through Pre-MET were clinically vulnerable and required close monitoring and escalation, supporting the findings of the present study.

Mortality was numerically lower in the Pre-MET group than in the MET group (35.4% vs. 43.5%), while 30-day readmission was also lower (10.8% vs. 13.5%); however, neither difference was statistically significant. Thus, the findings indicate a favourable numerical trend but do not establish that Pre-MET independently reduces mortality or readmission.

Overall, the study supports Pre-MET as an important strategy for early recognition and escalation of deterioration among oncology patients. However, the retrospective single-centre design and absence of adjustment for disease severity, cancer stage and treatment-related factors limit causal interpretation. Larger multicentre studies with multivariable analysis are recommended to determine the independent effect of Pre-MET on oncology patient outcomes.

5 CONCLUSION

The findings suggest that the Pre-MET escalation pathway was associated with lower mortality and lower 30-day readmission rates, although these differences were not statistically significant. Significant differences were observed in CCU length of stay and mechanical ventilation requirements between the two groups. Further studies with larger sample sizes and multivariable analysis are recommended to determine whether early deterioration recognition through Pre-MET activation independently improves patient outcomes among oncology patients.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Acknowledgments

The authors sincerely express their gratitude to the management of Apollo Cancer Centre for granting permission to conduct this study. We extend our heartfelt thanks to the Institutional Ethics Committee for ethical approval and providing the necessary guidance and support throughout the study.

Disclosure of conflict of interest

No conflicts of interest regarding this manuscript.

Statement of informed consent

This study did not involve direct patient participation. As no identifying information was collected and patient confidentiality was maintained, the Institutional Ethics Committee (IEC) of Apollo Cancer Centre, Chennai, granted a waiver of informed consent.

REFERENCES

- [1] Bachmann, K. F., Michimura, S. J., Cioccarri, L., Schefold, J. C., & Messmer, A. S. (2025). The critical role of timely medical emergency team activation in oncological and non-oncological patients. *PloS one*, 20(5), e0324831. <https://doi.org/10.1371/journal.pone.0324831>
- [2] Donnelly, N., Fry, M., Elliott, R., & Merrick, E. (2024). The role of the ward nurse in recognition and response to clinical deterioration: a scoping review. *Contemporary Nurse*, 60(6), 584-613.
- [3] Tan, S. C., Hayes, L., Cross, A., Tacey, M., & Jones, D. (2023). Pre-medical emergency team activations - Patient characteristics, outcomes and predictors of deterioration. *Australian critical care : official journal of the Confederation of Australian Critical Care Nurses*, 36(6), 1078–1083. <https://doi.org/10.1016/j.aucc.2023.03.002>
- [4] Sprogis, S. K., Currey, J., Jones, D., & Considine, J. (2021). Use of the pre-medical emergency team tier of rapid response systems: A scoping Review. *Intensive & critical care nursing*, 65, 103041. <https://doi.org/10.1016/j.iccn.2021.103041>
- [5] Adielsson, A., Danielsson, C., Forkman, P., Karlsson, T., Pettersson, L., Herlitz, J., & Lundin, S. (2022). Outcome prediction for patients assessed by the medical emergency team: a retrospective cohort study. *BMC emergency medicine*, 22(1), 200. <https://doi.org/10.1186/s12873-022-00739-w>
- [6] Sprogis, S. K. (2022). Exploring the pre-medical emergency team tier of rapid response systems (Doctoral dissertation, Deakin University).
- [7] Sprogis, S. K., Street, M., Currey, J., Jones, D., Newnham, E., & Considine, J. (2021). Modifications to medical emergency team activation criteria and implications for patient safety: a point prevalence study. *Australian Critical Care*, 34(6), 580-586.

- [8] Zibdawi, R. M., Carroll, L., Gibney, R. N., McKinlay, D., Kullar, S., & Bagshaw, S. M. (2022). Evaluation of medical emergency team activations in patients with limitations-of-medical-therapy: A retrospective cohort study. *Canadian Journal of Respiratory, Critical Care, and Sleep Medicine*, 6(5), 291-297.
- [9] Anderson, A. (2024). Library evidence report: Decision making for timely access to care.
- [10] Banerjee, U., Flinsi, D. M., & Rajan, S. (2023). Digital health in a corporate hospital in India: a nursing perspective. *CSI Transactions on ICT*, 11(1), 71-87.