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A comparative study between usage and efficiency of TIME tool versus PUSH tool for the assessment of pressure injury among intensive care patients

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Abstract

Background: Pressure injuries are a significant concern among patients admitted to intensive care units due to prolonged immobility, critical illness, and use of medical devices. Accurate wound assessment is essential for effective management and improved patient outcomes. This study aimed to compare the usage and efficiency of the TIME framework and the Pressure Ulcer Scale for Healing (PUSH) tool in assessing pressure injuries among intensive care patients.

Methods: A quantitative comparative observational study was conducted among 60 patients aged 40 years and above admitted to various intensive care units of a tertiary care hospital in Chennai. Thirty patients were assessed using the TIME tool and thirty using the PUSH tool. Data were collected using structured demographic and clinical assessment tools and analyzed using descriptive and inferential statistics.

Results: The PUSH tool demonstrated greater ease of use and consistency in scoring, while the TIME tool provided a more comprehensive clinical assessment of wound bed preparation. No statistically significant association was found between selected demographic variables and either tool score ($p > 0.05$).

Conclusion: Both the PUSH and TIME tools are effective in pressure injury assessment. The PUSH tool is suitable for routine monitoring, whereas the TIME framework supports detailed clinical decision-making. Using both tools complementarily may optimize wound management in intensive care settings.

Keywords: Pressure injury; Intensive care unit; PUSH tool; TIME framework; Wound assessment

1. Introduction

Pressure injuries, previously referred to as pressure ulcers or bedsores, are localized injuries to the skin and underlying tissue resulting from prolonged pressure, shear, or friction. Patients admitted to intensive care units (ICUs) are particularly vulnerable due to immobility, critical illness, and the use of life-supporting medical devices. Pressure injuries contribute to increased morbidity, prolonged hospital stay, and higher healthcare costs. Accurate assessment and timely intervention are essential for effective management.

Various tools are used to assess pressure injuries. The Pressure Ulcer Scale for Healing (PUSH) is a quantitative tool that monitors wound healing based on surface area, exudate amount, and tissue type. The TIME framework, which focuses on Tissue management, Infection or inflammation control, Moisture balance, and Edge of wound advancement, provides

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a holistic approach to wound bed preparation. This study compares the efficiency and clinical applicability of the TIME tool and PUSH tool among ICU patients.

2. Materials and Methods

Table 1 TIME Tool Framework (Wound Bed Preparation)

Component	Clinical Issue	Pathophysiology	Clinical Action	Outcome
Tissue	Non-viable tissue	Cell debris delays healing	Debridement	Viable wound bed
Infection/Inflammation	High bacterial load	Inflammatory cytokines	Antimicrobial therapy	Reduced infection
Moisture	Dry or excessive exudate	Delayed epithelial migration	Moisture balance	Optimal healing
Edge	Non-advancing wound edge	Keratinocyte dysfunction	Promote epithelialization	Advancing wound edge

A quantitative comparative observational study design was adopted. The study was conducted in the medical, surgical, cardiac, neurological, and cardiothoracic intensive care units of selected speciality hospitals, Chennai. A total of 60 patients aged 40 years and above with pressure injuries were selected using purposive sampling.

Inclusion criteria included patients with an expected ICU stay of more than five days and those who were bedfast or had limited mobility. Patients below 40 years of age, those with pre-existing pressure injuries, or those receiving specific wound interventions were excluded.

Data was collected using demographic and clinical variable proforma. Pressure injuries were assessed using the TIME tool for 30 patients and the PUSH tool for another 30 patients. Ethical approval was obtained from the Institutional Ethics Committee prior to data collection.

3. Results and Discussion

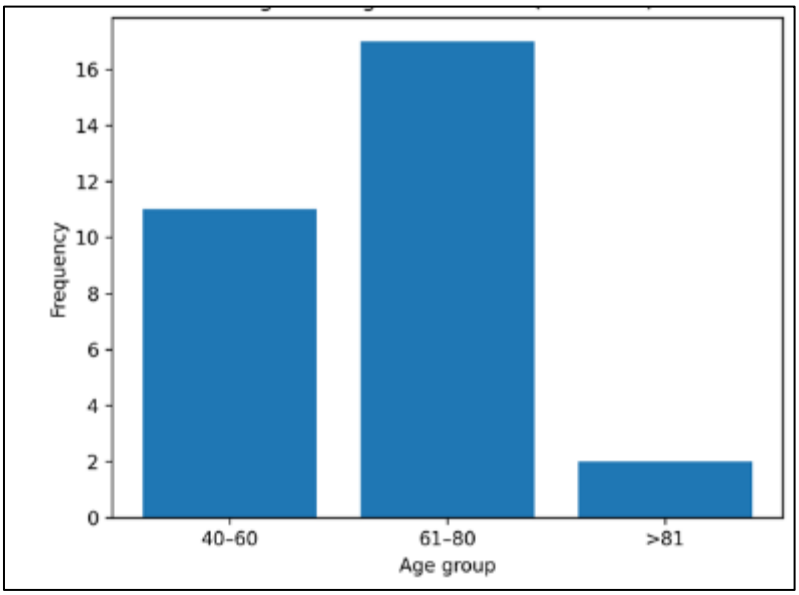

Figure 1 Age distribution among patients assessed using TIME tool

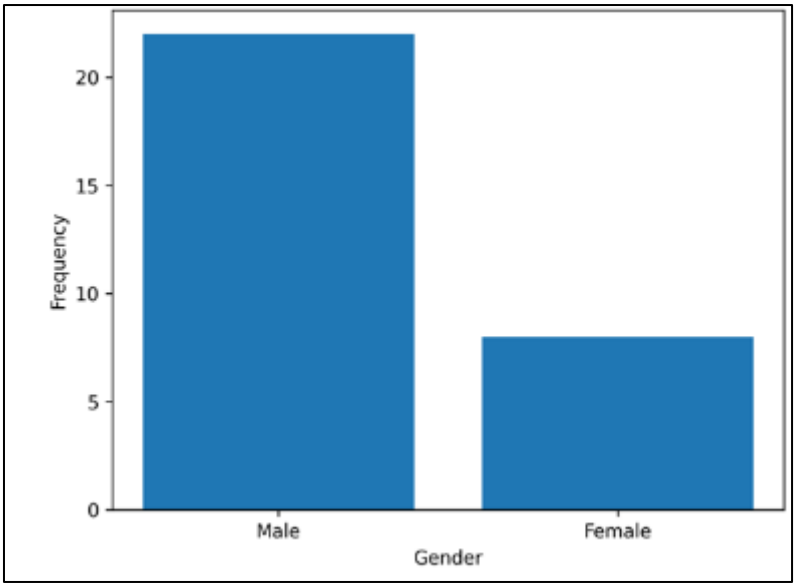

Figure 2 Gender distribution among patients assessed using TIME tool

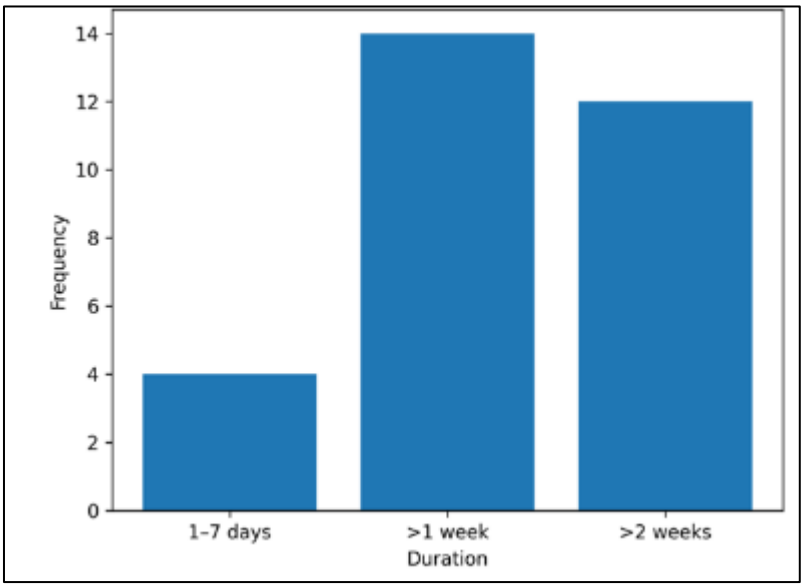

Figure 3 Duration of hospital stay among patients assessed using TIME tool

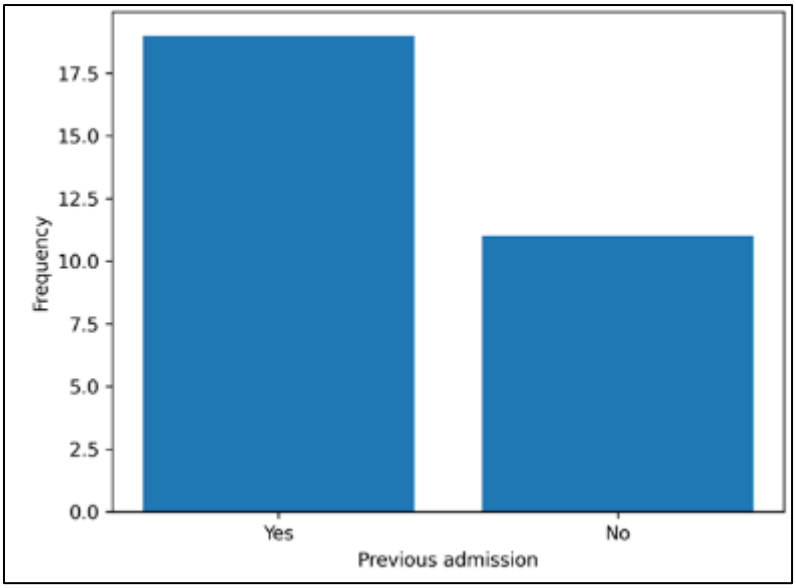

Figure 4 Previous admission status among patients assessed using TIME tool

Most patients belonged to the age group of 61–80 years. Male patients predominated in both groups. Analysis revealed no statistically significant association between demographic variables and TIME or PUSH tool scores ($p > 0.05$).

Table 2 Frequency and percentage distribution of clinical variables in TIME tool (n=30)

Clinical Variable	Frequency	Percentage (%)
Wound removed	12	40.0
Debridement	4	13.3
Bactigrass / paraffin dressing	14	46.7
Swab / culture	13	43.3
Antibiotic therapy	17	56.7

Table 3 Frequency and percentage distribution of clinical variables in PUSH tool (n=30)

Clinical Variable	Frequency	Percentage (%)
Wound size 4.1–8.0	12	40.0
Light exudate	16	53.3
Moderate exudate	9	30.0
Epithelial tissue	16	53.3

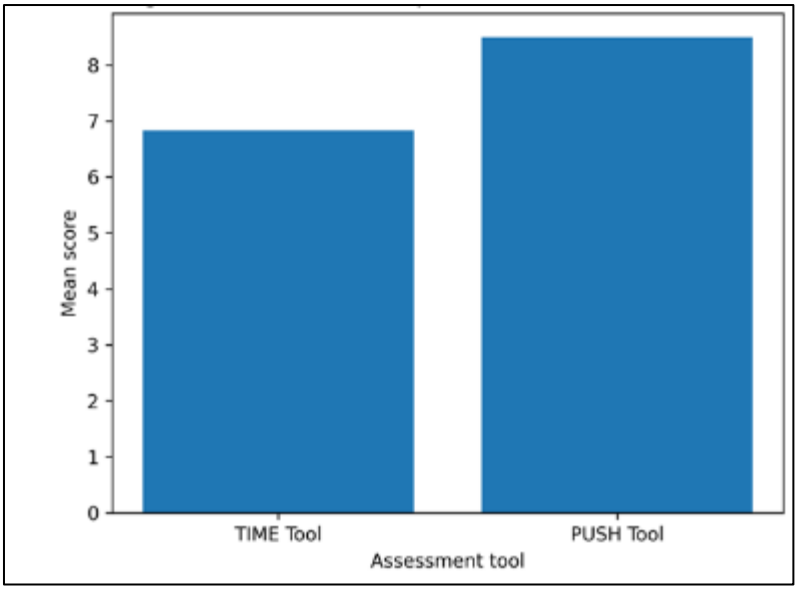

Figure 5 Mean score comparison between TIME and PUSH tools

The PUSH tool demonstrates ease of use and better inter-rater reliability, making it suitable for routine monitoring. The TIME framework provides comprehensive wound assessment, facilitating individualized treatment planning. Findings suggest that combining both tools enhances pressure injury management in intensive care settings.

4. Conclusion

Both the PUSH tool and TIME framework are valuable in the assessment of pressure injuries. The PUSH tool is efficient for standardized monitoring, while the TIME framework supports advanced wound assessment and clinical decision-making. A combined approach is recommended to improve patient outcomes in intensive care units.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

No conflict of interest.

Statement of ethical approval

Ethical approval was obtained from the Institutional Ethics Committee – Biomedical Research, Apollo Hospitals, Chennai (IEC – BMR App No: AVH-C-S-003/03-25).

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