Utilizing Statistical Tools to Evaluate Staffing and Patient Safety

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Background

Hospital-acquired conditions (HACs) represent significant risks to patient safety and quality of care. This pediatric intensive care unit has been looking for other factors that may impact the HAC rate. By identifying correlations between these factors and HACs, organizations can enhance resource allocation, staffing models, and patient care protocols to improve outcomes and reduce adverse events.

Purpose

This study aims to identify statistically significant relationships between HACs and specific variables: staff overtime, use of contracted staff, nurse tenure, and patient acuity. The findings will help determine if and how these factors influence the rate of HACs, providing insights into staffing and workload strategies to optimize patient safety.

Methods

A retrospective statistical analysis was conducted using data from the Pediatric Intensive Care Unit over the past two years. Key metrics collected included the frequency of HACs, overtime hours, the proportion of contracted staff, nurse tenure, and patient acuity scores. Correlation and regression analyses were applied to determine the strength and significance of associations between these factors and HACs.

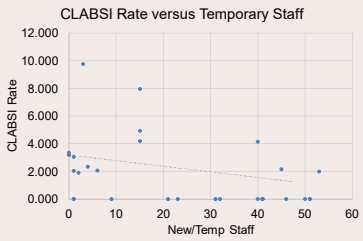
Findings

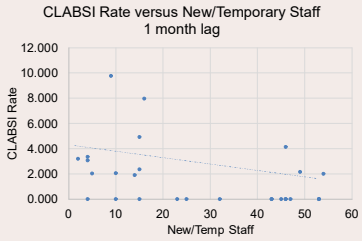
Non-Significant Findings

- No correlation between overall HAC rates and new nurses off orientation, experienced RNs off orientation, or traveling staff.
- No statistical significance found for PIVIE, UE, or HAPI with any staffing or acuity variables.
- Overtime FTEs were not significantly related to HAC rates, with the exception of HAPI.

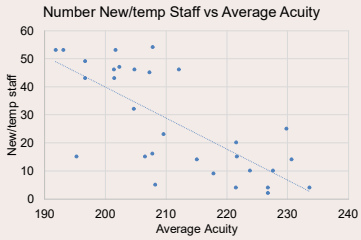
Moderate Statistical Significance

CLABSI Rate & Temporary Staff (-0.44): Negative correlation strengthens (-0.48) when factoring in new staff and adjusting for a one-month lag.

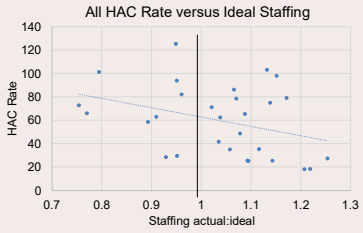


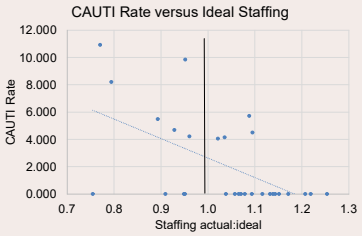


Average Patient Acuity & New/Temporary Staff (-0.71): Strongest negative correlation, indicating staffing adjusts well to patient acuity trends.

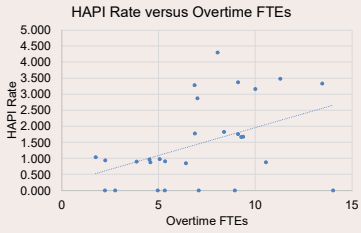


HAC Rate & Ideal Staffing Model (-0.35): Suggests ensuring proper staffing levels is key to reducing HACs. CAUTI had the strongest individual HAC correlation (-0.51).





HAPI Rate & Overtime FTEs (0.28): Positive correlation, suggesting repeated patient assignments may impact thorough assessments.



Implications for Nursing Practice

- **New Assessments Reduce HAPI Risk:** Rotating nurses to introduce fresh assessments each shift may help prevent pressure injuries.
- **Overtime Management:** Overworked nurses may miss critical patient assessments, potentially increasing HAPI risk. Consider policies that prevent excessive overtime assignments.
- **Temporary Staff Can Improve CLABSI Outcomes:** More staff, even temporary or newly oriented ones, lead to fewer CLABSIs, supporting the ideal staffing model.
- **Maintain Optimal Staffing to Acuity Model:** The ideal nurse-to-patient acuity ratio of 230 should be regularly re-evaluated.
- **Staffing Quantity Matters More Than Experience:** Additional licensed professionals at the bedside reduce HAC rates more than nurse experience levels.

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References