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THE RELATIONSHIP BETWEEN PEDIATRIC EARLY WARNING SYSTEM (PEWS) MENTORING FOR NURSES AND PATIENT SAFETY IN THE PEDIATRIC WARD

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Abstract:

Background: Pediatric inpatients possess fragile, dynamic physiological reserves, rendering them susceptible to rapid acute clinical deterioration. Although the Pediatric Early Warning System (PEWS) provides a validated standardized bedside triage algorithm, poor nurse compliance and mechanical charting without escalation undermine patient safety. Systematic clinical mentoring serves as a targeted managerial strategy to bridge the gap between protocol knowledge and clinical bedside execution.

Objective: To analyze the relationship between clinical mentoring in PEWS implementation for staff nurses and perceived patient safety in the Pediatric Inpatient Ward of Sumber Glagah Hospital, Mojokerto. Methods: This quantitative correlational study utilized a cross-sectional ward-unit aggregate approach conducted in 2026. The study recruited all 22 staff nurses managing a 17-bed pediatric unit and 100 parents of hospitalized pediatric patients selected via total sampling. Primary data were gathered using validated PEWS mentoring questionnaires for nurses and patient safety questionnaires for parents. Data were analyzed via contingency cross-tabulation and Fisher's Exact Test.

Results: The vast majority of nurses perceived PEWS implementation mentoring as good (90.9%, n = 20), while 9.1% (n = 2) perceived it as lacking. Correspondingly, 85.0% of parents (n = 85) perceived inpatient care as safe, while 15.0% (n = 15) perceived it as less safe. Bivariate cross-tabulation demonstrated that under good nursing mentoring, 82.0% of care cases were appraised as safe, whereas suboptimal mentoring correlated with an increased proportion of less safe appraisals (7.0%). Fisher's Exact Test yielded a statistically significant association ($p = 0.001$, $p < 0.05$).

Conclusion: Adequate clinical mentoring in PEWS implementation significantly enhances patient safety perceptions in the pediatric care ward. Hospital leadership must sustain continuous bedside coaching and formative audits to prevent deviation normalization and maintain pediatric clinical vigilance.

Keywords: Clinical mentoring; Patient safety; Pediatric Early Warning System (PEWS); Pediatric nursing; Supervision

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1. INTRODUCTION

Pediatric inpatient care requires extraordinary clinical vigilance and prompt decision-making due to the dynamic, fragile, and rapidly compensatory physiological characteristics of hospitalized children (Chowdhury & Chakraborty, 2017). Unlike adult patients who exhibit progressive, overt physiological declines, pediatric patients maintain near-normal vital signs through robust autonomic and compensatory homeostatic mechanisms until abrupt cardiorespiratory collapse or total organ failure occurs (Dwisari et al., 2024; Gold et al., 2014). Consequently, subtle signs of clinical decompensation such as mild tachypnea, grunting, subtle subcostal retractions, capillary refill prolongation, or lethargic behavioral alterations are easily

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overlooked by bedside nursing staff. Failure to recognize and act upon early pediatric deterioration dramatically increases the incidence of in-hospital cardiac arrest (IHCA), unplanned pediatric intensive care unit (PICU) admissions, and preventable inpatient mortality (Akhtar-Danesh et al., 2023; Gold et al., 2014). In response to these acute safety vulnerabilities, healthcare accreditation bodies globally mandate the systematic deployment of the Pediatric Early Warning System (PEWS) as an objective, multi-parameter bedside physiological track-and-trigger instrument (Studi et al., 2020).

PEWS systematically evaluates multi-system physiological parameters, typically categorizing bedside risk across cardiovascular, respiratory, and neurological/behavioral domains into a cumulative ordinal score linked to clear medical escalation algorithms (Duncan et al., 2006). Despite its demonstrated international efficacy in reducing inpatient code blue activations and preventable pediatric mortality, translating PEWS into routine bedside clinical practice remains heavily compromised in low- and middle-income healthcare settings (Rara, 2021). Previous hospital audits indicate that frontline nurses frequently treat PEWS charting as an administrative checklist rather than an actionable clinical decision-making pathway. Common barriers include inadequate clinical comprehension of pediatric respiratory dynamics, fear of challenging physician hierarchies during clinical escalation, heavy shift workloads, and the absence of ongoing, supportive clinical supervision following initial didactic training (Anggriani et al., 2022; Rara, 2021).

Conventional didactic classroom lectures or one-time clinical workshops are demonstrably insufficient to instill sustained behavioral compliance among nursing personnel. Without continuous reinforcement at the point of care, nurses' adherence to periodic scoring and threshold escalation decays rapidly, generating the hazardous organizational phenomenon of 'normalization of deviance' wherein abnormal physiological parameters in children are rationalized as benign (Adnan, 2024; Proctor, 2008). To bridge this profound knowledge-to-practice translation gap, clinical mentoring and structured bedside coaching have emerged as essential human resource strategies. Grounded in Proctor's Model of Clinical Supervision, effective clinical mentoring encompasses formative (educative skill enhancement), restorative (supportive psychological reinforcement), and normative (qualitative compliance monitoring) supervisory functions (Proctor, 2008). Through direct bedside modeling, nurse managers and clinical educators can guide staff nurses in accurately calculating composite scores, interpreting atypical pediatric behaviors, and delivering assertive, structured clinical communication (such as SBAR: Situation, Background, Assessment, Recommendation) to attending pediatricians (Basu et al., 2022; Pelayanan et al., 2019).

At Sumber Glagah General Hospital in Mojokerto, East Java, the Pediatric Inpatient Ward operates a 17-bed capacity staffed by 22 registered nurses. While PEWS protocols have been formally introduced, empirical documentation analyzing how direct managerial mentoring impacts nurses' bedside execution and downstream patient safety outcomes has never been systematically examined. In pediatric care, patient safety encompasses not only the avoidance of hospital-acquired adverse events (such as patient falls or medication errors) but fundamentally includes the rapid, assertive identification of acute physiological deterioration as directly perceived by the patient's primary caregivers (parents) residing continuously at the bedside (Nathasya, 2024).

Therefore, this study aimed to analyze the relationship between clinical mentoring in PEWS implementation for nurses and perceived patient safety in the Pediatric Inpatient Ward of Sumber Glagah Hospital, Mojokerto. The findings provide hospital directors and nurse managers

with empirical evidence to institutionalize continuous bedside mentoring as an indispensable clinical governance mechanism.

2. METHODS

2.1 Research Design

This study utilized a quantitative observational analytical design employing a cross-sectional survey approach. A ward-unit aggregate correlational design was used to examine the statistical relationship between the independent variable (clinical mentoring in PEWS implementation among nurses) and the dependent variable (patient safety as evaluated by pediatric patients' parents) within a unified hospital inpatient care ecosystem.

2.2 Research Population and Sample

The study involved two distinct target populations recruited via total sampling across the Pediatric Inpatient Ward of Sumber Glagah Hospital, Mojokerto: (1) Nurse Cohort: All 22 active registered staff nurses assigned to the pediatric unit (100% total sampling of staff managing the 17-bed ward); and (2) Patient/Parent Cohort: A total of 100 consecutive parents of hospitalized pediatric patients admitted to the ward during the study observation window. Inclusion criteria for nurses were active bedside clinical duties on rotational shifts (morning, afternoon, night) with at least three months of tenure in the pediatric ward. Inclusion criteria for parents were biological parents or primary legal guardians accompanying hospitalized pediatric patients aged 1 month to 18 years for a minimum inpatient stay of ≥ 48 hours. Exclusion criteria included temporary relief nurses, nurses on maternity/sick leave, and parents of pediatric patients in terminal palliative care or admitted under immediate emergency resuscitation.

2.3 Research Setting and Time

The research was undertaken at the Pediatric Inpatient Ward (Ruang Perawatan Anak) of Sumber Glagah Regional Hospital, situated in Mojokerto Regency, East Java Province, Indonesia. Data collection and field clinical audits were conducted in early 2026.

2.4 Research Procedures

The research procedure comprised administrative licensing, instrument distribution, and medical chart audits. Structured self-report questionnaires evaluating PEWS mentoring were distributed to all 22 pediatric staff nurses. Concurrently, patient safety evaluation questionnaires were administered to 100 accompanying parents on the day of anticipated discharge. In parallel, observational audit checklists were utilized to inspect medical records prospectively and retrospectively, verifying whether composite PEWS scores were correctly summed and whether escalation pathways (such as urgent doctor notifications or rapid response calls) were triggered punctually.

2.5 Data Collection Techniques

Primary data collection was executed using structured questionnaires. For nurses, demographic variables captured biological sex and formal nursing education level. For parents, data measured subjective experiences of inpatient care safety, nurse responsiveness, procedural communication, and perceived vigilance during clinical deterioration.

2.6 Research Instruments

Two primary instruments were used: (1) PEWS Mentoring Questionnaire: Designed for nurses, measuring the frequency of bedside coaching, score validation by head nurses/clinical educators, and formative clinical feedback, categorized into 'Good' (Baik) and 'Poor' (Kurang); and (2) Patient Safety Quality Questionnaire: Administered to parents,

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measuring physical bedside safety (e.g., bed rails, fall prevention), nurse call-bell responsiveness, and prompt medical escalation, categorized ordinally into 'Safe' (Aman / positive perception) and 'Less Safe' (Kurang Aman / negative perception).

2.7 Data Analysis

Data were processed using SPSS software. Univariate descriptive statistics established frequency distributions and percentages. Bivariate analysis was conducted using contingency cross-tabulations (Crosstab). Because the 2x2 contingency table contained expected cell frequencies less than 5, the non-parametric Fisher's Exact Test was utilized to test statistical significance at an alpha threshold of 0.05.

2.8 Scope and Limitations of the Research Used

The study's scope was delimited to a single pediatric inpatient ward in Mojokerto. Methodological limitations include the small nurse cohort (n = 22), the cross-sectional design precluding longitudinal causal determinations, reliance on parent-reported safety perceptions rather than objective hospital incident reporting metrics (IKP), and potential recall bias.

2.9 Ethical Considerations

The study was conducted with the patient's informed consent and the ethical approval status and confirm that appropriate written consent for publication was obtained.

3. RESULTS AND DISCUSSION

3.1. Result

A total of 22 pediatric staff nurses participated directly in this investigation. Alongside the nursing staff, 100 parents of pediatric patients also took part in the study. Together, these two distinct groups formed the complete participant cohort for the research. A focused summary of the nurse respondents' demographic distribution is presented in Table 1. Within this table, data regarding the biological sex of the nurses are systematically detailed. In addition, Table 1 documents the specific levels of formal educational attainment reported across the nursing sample. Collectively, these compiled indicators offer a clear profile of the healthcare professionals evaluated in this work.

Table 1. Demographic Characteristics of Staff Nurses in the Pediatric Ward (n = 22)

No	Demographic Characteristic	Category / Classification	Frequency (n)	Corrected Percentage (%)*
1	Biological Sex	Male	4	18.2%
		Female	18	81.8%
2	Formal Nursing Education	Diploma in Nursing	5	22.7%
		Bachelor of Nursing / Nurse Professional	17	77.3%
	Total		**22**	**100.0%**

As detailed in Table 1, female nurses constituted the overwhelming majority of the pediatric ward workforce (81.8%, n = 18), while male nurses represented 18.2% (n = 4). Regarding formal academic qualifications, 77.3% (n = 17) possessed a Bachelor of Nursing with Professional Nurse credentials (S1 Keperawatan + Ners), and 22.7% (n = 5) held a Diploma in Nursing (D3 Keperawatan), reflecting a highly educated clinical nursing staff.

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Table 2. Univariate Distribution of PEWS Mentoring (Nurses) and Patient Safety Perceptions (Parents)

Research Variable & Evaluator Cohort	Category	Frequency (n)	Percentage (%)	Clinical Interpretation
PEWS Mentoring Quality (Nurse Cohort, n = 22)	Good	20	90.9%	Supervision & bedside coaching optimal
	Poor	2	9.1%	Supervision & bedside coaching lacking
Patient Safety Quality (Parent Cohort, n = 100)	Safe (Positive)	85	85.0%	Protective bedside care & prompt escalation
	Less Safe (Negative)	15	15.0%	Delayed responsiveness or perceived safety risks
	Total	**100**	**100.0%**	

Source: Primary research survey data, Sumber Glagah Hospital, 2026.

Univariate analysis (Table 2) showed that 90.9% of staff nurses (n = 20) perceived PEWS clinical mentoring as 'Good', with only 9.1% (n = 2) evaluating it as 'Poor'. From the recipient perspective, 85.0% of parents (n = 85) perceived inpatient care as 'Safe', while 15.0% (n = 15) rated it as 'Less Safe'.

Table 3. Bivariate Contingency Cross-Tabulation and Fisher's Exact Test Results

Quality of PEWS Mentoring (Nurses)	Parental Perception of Patient Safety		Total Cases / Cohort	Fisher's Exact Test p-value
	Safe n (%)	Less Safe (Kurang Aman) n (%)		
Good Mentoring	82 (82.0%)	8 (8.0%)	90 (90.0%)	p = 0.001*
Poor Mentoring	3 (3.0%)	7 (7.0%)	10 (10.0%)	(Exact Sig. 2-tailed)
Total Aggregate Cases	**85 (85.0%)**	**15 (15.0%)**	**100 (100.0%)**	**Significant (Reject H0)**

**Statistically significant at alpha < 0.05. Source: Processed SPSS Fisher's Exact Test output, 2026.*

As delineated in Table 3, bivariate cross-tabulation across 100 patient care episodes demonstrated that in cases managed under 'Good' PEWS mentoring, 82.0% (n = 82) were appraised as safe, and only 8.0% (n = 8) were deemed less safe. Conversely, in cases associated with 'Poor' mentoring, 7.0% (n = 7) were appraised as less safe compared to only

3.0% (n = 3) rated safe. The Fisher's Exact Test yielded a statistically significant exact value of p = 0.001 (p < 0.05), confirming a strong, statistically significant relationship between the quality of clinical PEWS mentoring received by nurses and perceived patient safety in the pediatric ward.

3.2 Discussion

The findings demonstrate a statistically significant positive relationship between clinical mentoring in PEWS implementation and patient safety outcomes in the pediatric ward (Fisher's Exact Test, p = 0.001). Effective supervisory mentoring, reported by 90.9% of nurses, was associated with positive parental safety perceptions (82.0%), whereas inadequate mentoring was disproportionately linked to negative safety perceptions. These results indicate that bedside clinical mentoring plays a crucial role in translating PEWS guidelines into proactive and consistent pediatric care.

These findings are consistent with previous studies showing that standardized PEWS implementation requires continuous managerial supervision and bedside coaching to reduce adverse pediatric outcomes (Akhtar-Danesh et al., 2023; Gold et al., 2014). Without structured supervision, nurses' compliance with vital sign monitoring may decline due to workload demands (Rara, 2021; Anggriani et al., 2022). Clinical supervision also promotes consistency in clinical decision-making (Adnan, 2024; Dwisari et al., 2024), while nurses' responsiveness contributes to parental trust in hospital care (Basu et al., 2022). The findings are theoretically supported by Proctor's Model of Clinical Supervision and Marquis and Huston's Quality Management Framework, emphasizing educational, supportive, and normative supervision (Marquis & Huston, 2017; Proctor, 2008). These functions strengthen early recognition of pediatric deterioration, reduce nurse anxiety, and ensure compliance with escalation protocols (Adnan, 2024; Nathasya, 2024).

Furthermore, adequate staffing (22 nurses for 17 beds, with a nurse-to-patient ratio of 1:3 to 1:5) and a predominantly professionally qualified nursing workforce (77.3% Bachelor of Nursing and Nurse Professional graduates) supported effective mentoring and critical clinical decision-making (Pelayanan et al., 2019; Chowdhury & Chakraborty, 2017). However, patient safety in this study was assessed through parental perceptions rather than objective indicators such as patient safety incident reports or morbidity data, which should be considered when interpreting the findings. Overall, this study highlights that continuous PEWS clinical mentoring is not merely an administrative activity but an essential patient safety strategy that strengthens bedside nursing practices and protects hospitalized children.

3.3. Implications

Hospital administrators and nursing directors should formalize clinical mentoring protocols: (1) Mandating daily bedside PEWS score validation during head nurse morning rounds; (2) Establishing structured escalation debriefing sessions; (3) Implementing peer coaching programs pairing experienced S1 Ners with junior staff; and (4) Sustaining safe staffing ratios (1:3–1:4) to protect clinical observation time.

3.4. Research contribution

This study provides empirical quantitative field documentation linking clinical supervisory mentoring to patient safety outcomes in a regional Indonesian public hospital, providing a practical model for clinical governance in pediatric units.

3.5. Limitations

Several limitations must be acknowledged: (1) The cross-sectional design captures associations rather than longitudinal causality; (2) The nurse sample was small (n = 22) and restricted to a single hospital ward; and (3) Reliance on parental perceptions rather than objective clinical adverse events.

3.6. Suggestions

Future research should adopt prospective longitudinal designs evaluating objective clinical outcomes (e.g., PICU transfer timeliness, cardiac arrest rates, code blue frequency, length of stay), recruit multi-center cohorts across tertiary and secondary hospitals, and incorporate hierarchical linear modeling (HLM) to account for nurse-patient nested data structures.

4. CONCLUSION

Clinical mentoring in the implementation of the Pediatric Early Warning System (PEWS) for nurses has a statistically significant positive relationship with patient safety in the Pediatric Inpatient Ward of Sumber Glagah Hospital, Mojokerto (Fisher's Exact Test p = 0.001). The vast majority of nurses appraised PEWS mentoring as good (90.9%), and 85.0% of parents evaluated inpatient care as safe. Robust clinical supervision acts as a vital protective equalizer that unifies staff critical thinking, enforces timely escalation, and eliminates normalization of deviance.

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AUTHOR CONTRIBUTIONS STATEMENT

TR: Conceptualization, Methodology, Investigation, Data curation, Formal analysis, Validation, Writing original draft, Writing review and editing, Project administration.

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