

EBP Project: Improving Patient Safety by Reducing Nurses' Alarm Fatigue

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Objectives

- Discuss PICOT question
- Describe search strategy including search terms, databases used, and limits
- Discuss type, level and quality of evidence found
- Critique articles used as evidence
- Discuss implications for nursing practice, education, and research

PICOT Question

- In the NICU (P), how does implementation of the CEASE bundle (I) compared to not implementing the bundle (C) affect nurses' alarm fatigue (O) within 90 days(T)?



Outcome
Measurements

- **Nurses' perception of alarm fatigue as evidenced by the Healthcare Technology Foundation Clinical Alarms Survey**
- **Reduction in the scores would be evidence of impact.**

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Terms Searched

- Alarm fatigue
- Nurses alarm fatigue
- Critical care
- Intensive care
- NICU
- Neonatal intensive care
- CEASE bundle

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Databases Searched & Limits

- **Databases:**
 - **CINAHL (Cumulative Index to Nursing and Allied Health Literature)**
 - **PubMed**
 - **Proquest**
- **Limits/Exclusions:**
 - **English Language**
 - **Human Studies**
 - **Published after 2017**



Type, Level, &
Quality of
Evidence

- **Level 1**
 - **Experimental (1), good**
 - **Systematic review (1), good**
- **Level 2**
 - **Quasi-experimental (2), good**
- **Level 3**
 - **Non-experimental (1), good**



Article Critique Findings

Article Critique #1a Findings

- Jeong, Y. J. & Kim, H. (2023).” Critical care nurses’ perceptions and practices towards clinical alarms.” *Nursing in Critical Care*, 28, 101-108.
- Level 3B
- Sample: 48 nurses, ICUs (2 units in 1 hospital)
- Findings: “Develop a standardized medical device alarm management protocol that can help identify different alarms correctly and respond to them rapidly and appropriately.”
- Limitations: No intervention was applied in this study, just a survey of nurses’ perceived alarm fatigue and small sample.

Article Critique #2 Findings

- Bi, J. Y. & Yin, X. (2020). “Effects of monitor alarm management training on nurses’ alarm fatigue.” *Journal of Clinical Nursing*, 29, 21-22.
- Level 2A
- Sample: 93 nurses, 1 ICU
- Findings: “Alarm fatigue was effectively decreased by the monitor alarm” training.
- Limitations: 1 ICU only, not in US, subject cross-chat, no long-term evaluation

Article Critique #3 Findings

- Lewandowska, K., Wiesbrot, M., Cieloszyk, A., Medrzycka-Dabrowska, W., Krupa, S. & Ozga, D. (2020). “Impact of alarm fatigue on work of nurses in an intensive care environment — A systematic review.” *International Journal of Environmental Research and Public Health*, 17(22), 8409
- Level 3B, systematic review
- Sample: 7 publications included
- Findings: Clinically insignificant alarms are 85 – 99% of total, used HTF survey for evaluation, recommend ”alarm management strategy.”
- Limitations: small number of articles, diverse, but not contradictory, findings

Article Critique #4 Findings

- Lewis, C. L. O. & Oster, C. A. (2019). “Research outcomes of implementing CEASE: An innovative, nurse-driven, evidence-based, patient-customized monitoring bundle to decrease alarm fatigue in intensive care unit.” *Dimensions of Critical Care Nursing*, 38(3), 1-17.
- Level 2B
- Sample: 74 nurses, 1 ICU
- Findings: Decreased total number of monitoring alarms improved nurse perception of alarm fatigue.
- Limitations: limited sample, 23% final response rate (34% average), no explanation for drop-outs

Article Critique #5 Findings

- Lindell, C. (2018). Medical device alarm systems: *A multi-hospital study of alarm-related events, caregiver alarm response, and their contributing factors*. (Publication No. 10808582) [Doctoral Dissertation, University of Wisconsin-Milwaukee.] ProQuest Dissertations and Theses Global.
 - Level 3B
 - Sample: nurses (107), alarm data (88,307), multiple hospitals (4)
 - Findings: Includes quantitative and qualitative results, compared self-report of alarms to actual numbers of alarms, survey comments, review of alarm-related policy and procedure, and staff interviews.
 - Limitations: some low response rates, varied by hospital, clinician self-report bias

Answer to PICOT Question

- In the NICU (P), how does implementation of the CEASE bundle (I) compared to not implementing the bundle (C) affect nurses' alarm fatigue (O) within 90 days(T)?
- Consensus trend is to implement the CEASE bundle to reduce nurses' alarm fatigue.

Implications



ECRI (2020) identified alarm fatigue as a top 10 patient safety concern.



The CEASE bundle is the solution identified by more than one report and is recommended by AACN.



Further research on the CEASE bundle is needed to evaluate long-term effects and additional outcomes specific to patient safety.

References

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Thank you!

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