Alarm Fatigue & Nurse Job Outcomes

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Table of Contents

Alarm Fatigue Overview

Physiologic monitor alarms should enhance patient safety but instead have become a patient safety problem.

- In the ICU, up to 310 alarms per patient per day

- \> 85% are artifact or not clinically relevant

- Lose trust in alarms

- Become desensitized to alarms

- Face competing priorities

- Missed critical patient events

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- In the ICU, up to 310 alarms per patient per day

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Charité Alarm Fatigue Questionnaire Overview

QUESTIONNAIRE LOGISTICS

- **Aim:** To measure alarm fatigue in nurses to assess whether interventions to reduce alarms in ICUs actually improved burnout of nurses

- Nine item Questionnaire
    - Items relate to the physical, mental, and emotional toil of alarms in the ICU during and after a nurse's shift

- Originally in German
    - Translated to English
    - Translation lost the cultural validity of questions

Charité Alarm Fatigue Questionnaire Overview

PROJECT AIM

Establish a survey to be comprehensible by U.S. standards, so hospital management can mitigate the problems that alarms cause ICU nurses

Charité Alarm Fatigue Methods

Translation of Questionnaire to English

Recruitment of 12 ICU Nurse Participants with work experience of 1-30 years
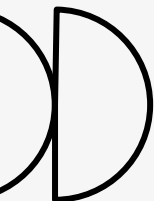
Data Collection	Interviews	Transcription
Used Redcap to collect Informed Consent & Demographic Information	20-25 minute semi-structured, recorded Zoom interviews	Edit Zoom scripts and code interviews for specific words and themes

CAFQa: Charité Alarm Fatigue Questionnaire

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		I completely disagree	I disagree	Neutral	I agree	I completely agree
1.	My work performance is impaired by too many alarms on my unit.	☐	☐	☐	☐	☐
2.	I experience physical symptoms (e.g., headache, sleep disturbances) when there are too many alarms on my unit.	☐	☐	☐	☐	☐
3.	Alarms reduce my concentration.	☐	☐	☐	☐	☐
4.	Alarms from my patients or neighboring patients frequently interrupt my workflow.	☐	☐	☐	☐	☐
5.	There are situations in which alarms cause me confusion.	☐	☐	☐	☐	☐
6.	We have up-to-date policies and/or procedures for alarm management on my unit.	☐	☐	☐	☐	☐
7.	Alarms are addressed quickly on my unit.	☐	☐	☐	☐	☐
8.	When an alarm sounds on my unit, it is easy to determine the patient, alarming device, and the alarms level of urgency.	☐	☐	☐	☐	☐
9.	On my unit, physiologic monitor alarm limit settings are regularly adjusted based on patients' clinical conditions (e.g., blood pressure limits after cardiac surgery).	☐	☐	☐	☐	☐

Charité Alarm Fatigue Results

5. There are situations in which alarms cause me confusion. ☐ ☐ ☐ ☐ ☐

"I don't know that situations is the right word."

- Participant #6, answered Neutral

"I guess I'm just kind of confused by what? How like alarms causing me confusion. What that means."

- Participant #4, *no answer*

"I actually like that. This one seemed inclusive of all alarms."

- Participant #7, answered Agree

URF Alarm Fatigue & Burnout Project Overview

High alarm burden is a patient safety problem → gaps in research prevent development of alarm reduction strategies

URF aims to close those gaps

AIM #3

Evaluate whether and to what extent nurse alarm burden is associated with nurse job outcomes (i.e., burnout, job dissatisfaction, intent to leave).

URF Alarm Fatigue Methods

Step #1

RN4CAST-New York/Illinois survey of registered nurses

➡️

Step #2

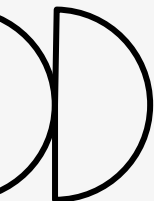Link survey data to American Hospital Association Annual Survey Data

Step #3

➡️ Identify hospital characteristics: size, tech, teaching status

➡️

Step #4

Construct mixed effects linear and logistic regression models in R

URF Alarm Fatigue Results

Table 3. Association between alarm burden items and high burnout (multivariable logistic regression).

	Overwhelm alone	Unadjusted	Adjusted for Hospital Characteristics	+Adjusted for Nurse Work Environment	+Adjusted for Staffing
Overwhelm	4.192 (3.267, 5.407)	2.478 (1.883, 3.269)	2.489 (1.887, 3.290)	2.559 (1.932, 3.398)	2.536 (1.913, 3.369)
Ignore	-	2.471 (2.027, 3.012)	2.505 (2.053, 3.057)	2.249 (1.836, 2.756)	2.234 (1.823, 2.738)
Delay	-	2.128 (1.659, 2.729)	2.152 (1.676, 2.764)	2.200 (1.708, 2.836)	2.197 (1.705, 2.832)

Note: Odds Ratio (95% Confidence Interval) Shown

Alarm burden remained significant even when controlling for hospital characteristics, nurse work environment, and staffing.

Key Takeaways

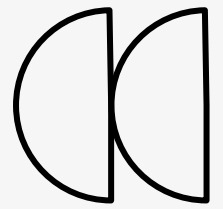**01** You don't have to say yes to everything.

02 Research behind hospital management is often overlooked.

03 Qualitative research, specifically interviews, are very valuable.
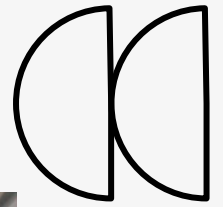
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- Penn Center for Health Outcomes and Policy Research

- Joanne Levy and Chinwe Nwadiogbu

- SUMR 2023 Cohort

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R is against me
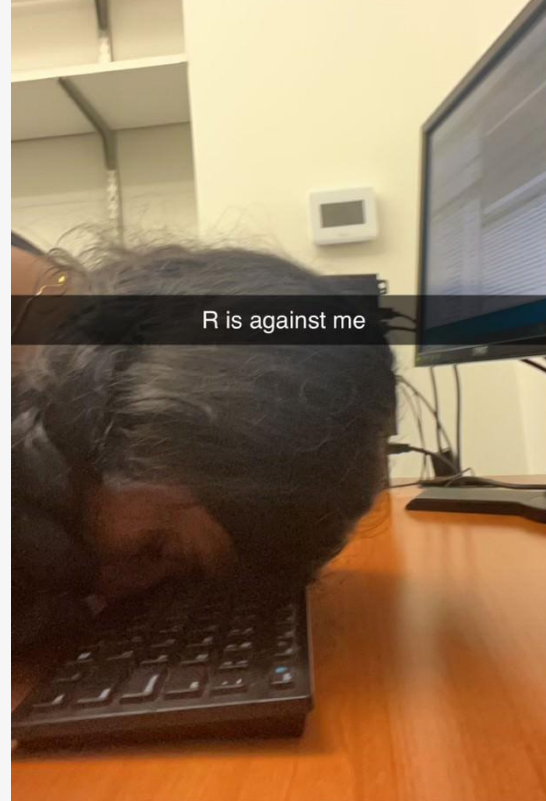
THANK YOU

QUESTIONS?

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