Evaluating the Impact of Formal Training on Staff Perception of Preparedness for Active Shooter Situations in the Perioperative Environment

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Abstract

This project examines the preparedness of operating room staff at a level one trauma center for an active shooter event, emphasizing the importance of safety perceptions and response protocols. 116 perioperative staff consisting of registered nurses, scrub technicians, hospital assistants, anesthesia technicians, administrators, and leadership members were surveyed about knowledge of active shooter response protocols and perceptions of safety within the operating room department. After an educational intervention given by the head of security and threat management, a paired t-test showed a significant increase in staff knowledge regarding emergency procedures and reporting mechanisms. The findings also revealed existing gaps in departmental security, underscoring the need for comprehensive training and robust security measures to create a safer environment for patients and healthcare providers.

Introduction

- Between 2000 and 2011, 154 hospital shootings led to 235 deaths and injuries.
- Ethical/moral dilemma: patient abandonment vs self-preservation
- Active shooter incidents in healthcare are rising, especially in high-risk areas like the operating room (OR).
- Many OR teams lack adequate training, leaving them vulnerable during such emergencies.
- Formal education is essential to ensure staff and patient safety during active shooter situations.
- Evidence shows most hospitals lack specialized training.
- Scenario-based education improves staff preparedness, confidence, and emergency response.
- PICOT question:
  "Among operating room staff, does formal education for an active shooter scenario in the operating room, as compared to current education practices, affect staff perception of response to emergencies in the intra-operative setting?"

Methodology

- Setting: RR Main OR with 23 operating rooms, 1 hybrid room, and 2 procedure rooms.
- Framework: Iowa Model for Evidence-Based Practice.
- Survey Tool: Pre- and post-surveys measuring:
  - Staff knowledge (via 3 yes/no questions)
    - Appropriate actions during an active shooter event
    - Reporting procedures
    - Existence of policies and inclusion in annual training
  - Perceptions of safety (via 4 Likert-scale questions)
    - Staff's overall sense of safety
    - Confidence in security measures
    - Awareness of escape/evacuation training
  - Participants:
    - RNs, CSTs, PSSTs, HAs, and Equipment Coordinators
    - 116 total participants; 102 viable responses
    - Incomplete surveys excluded from analysis
  - Data Analysis:
    - Two-tailed paired t-test used for comparison
    - Survey values reassigned as needed to ensure consistent positive/negative tone across responses

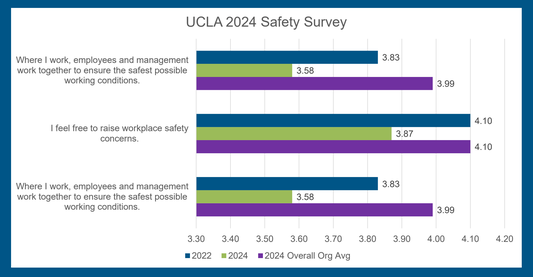
Results

Physical Walkthrough/Assessment

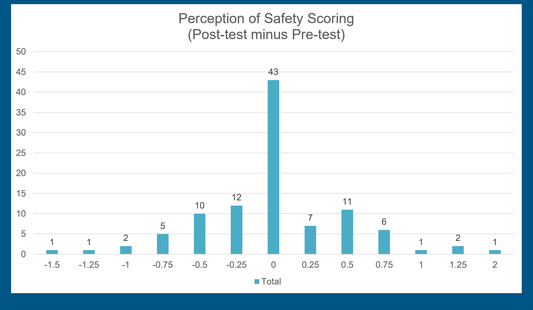
- UCLA Security and Head of Workplace Violence performed a walkthrough for the department to determine vulnerable points
  - The safety assessment of the department identified the following vulnerabilities in the Main OR:
  - Lack of notification system
  - Unlocked fire escape doors
  - No ability to lock down
  - No med sleds in ORs – whole department only has 2
  - No policy/no plan
  - Limited exits
  - No emergency drills
  - Procedure Rooms (PR) are isolated
- Current Events
  - "Swatting" events in nearby hospitals and colleges
- Security concerns reported in the past:
  - Breach of floor from outsiders
    - Via Fire escape doors
    - Via unsecured elevators
    - Doctor's lounge
    - Locker Rooms
    - Break Rooms
    - Fire Escape by break room
    - Attempted robbery in Parking Lot 1
  - Verbal threats not properly communicated
  - Staff from other departments found in restricted zone (eg Perfusion Room)
  - Blind spots in the front desk
  - Historical reports of active shooter on campus

Findings

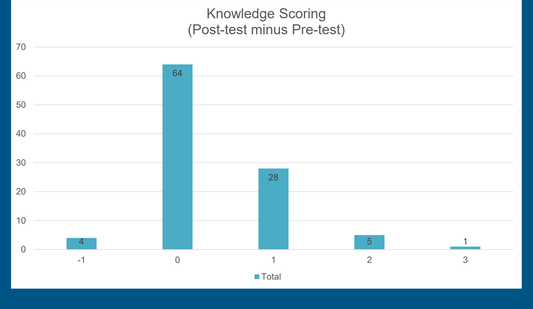
- Culture of Safety Results:
  - 2024 score: 3.58
  - 2022 score: 3.83
  - 2024 org-wide average: 3.99
  - Perception of teamwork between staff and management has declined.
- Freedom to Raise Concerns:
  - 2024 score: 3.87
  - 2022 score: 4.10
  - 2024 org-wide average: 4.10
  - Slight drop in comfort level when raising safety issues.



- Perception of Safety:
  - Scale: 1 = unfavorable perception of safety, 3 = neutral, 5 = favorable perception of safety
  - Mean score:
    - Pre: 3.223
    - Post: 3.230
  - Neutral: 42%
  - Shift after implementation:
    - 31% felt a negative shift
    - 28% felt a positive shift
- <u>There is no significant difference in staff perception of safety before and after active shooter training.</u>



- Knowledge:
  - The mean pre-test score was 57%, and increased to 69% after intervention (n=102)
  - <u>There is a significant difference in staff knowledge before and after active shooter training.</u>
- Bonus question:
  - Staff were asked to list the potential phone numbers to call
  - 83% were aware of the phone numbers to call regardless of the training
  - 10% gained knowledge after training



Limitations

- Question design – negative vs. positive question confusion
- Perceived importance of this topic to staff
- Accuracy of the two interventions (unscripted)
- Instructions for pre-test/intervention/post-test and accuracy (unscripted)
- Unintelligible answers/incomplete surveys/multiple responses per question
- Not all staff received training

Conclusions

- Formal, scenario-based education significantly improved staff knowledge of active shooter protocols in the perioperative setting.
- Perceptions of safety showed no statistically significant change, suggesting that knowledge gains alone may not shift how safe staff feel without concurrent environmental and policy improvements.
- The walkthrough with security revealed critical safety gaps, emphasizing the need for ongoing training, infrastructure upgrades, and standardized emergency drills.
- Continued efforts should focus on bridging knowledge with tangible safety enhancements to build a stronger culture of preparedness and security in high-risk clinical areas like the OR.

Recommendations

- After the walkthrough with security, the following recommendations were proposed:
  - Light notification system vs Vocera notification
  - Deadbolt locks to be installed inside the OR doors
  - Med Sleds for every OR
  - Include checking fire escapes in daily rounds – ensure that fire escape doors are locked from the outside
  - Badge reader only access in specific door areas
  - Security will also meet with Cath Lab and Interventional Radiology (IR) to discuss securing their perimeter
- Recommendations for training and delivery:
  - Have the instruction and education delivery standardized/scripted
  - Allow ample time before training for pre-implementation data to be collected
  - Recorded session
  - Allow for alternative schedules for staff to receive training
  - Annual evacuation drills and active shooter drills

Survey Sample

References