

Evaluation of a Brief Team Training Intervention in Surgery: A Mixed-Methods Study

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ABSTRACT

The aim of this study was to evaluate a brief team training program in relation to teams' observed nontechnical skills (NTSs) in surgery, teams' perceptions of safety culture, and the training implementation. We used mixed methods to analyze structured observations of 179 surgeries, semi-structured interviews with surgical team members from four selected surgical specialties, and a survey. There were significant ($P < .001$) improvements in surgical teams' observed NTSs and in the use of the World Health Organization's Surgical Safety Checklist after participation in the training program. Nonsignificant results included increased perceived safety climate and decreased perceived teamwork climate. From participant interviews, we identified that production pressure and time constraints were the biggest barriers to implementation and the greatest enabler was the organization's support for staff education initiatives. Most participants perceived the content of the program to be useful. These results highlight the complexities inherent in the development and evaluation of interdisciplinary patient safety interventions. *AORN J* 106 (December 2017) 513-522. © AORN, Inc, 2017. <https://doi.org/10.1016/j.aorn.2017.09.013>

Key words: team training, nontechnical skills, Surgical Safety Checklist, safety culture, Teamwork and Safety Climate Survey.

The OR is a high-risk environment¹⁻⁴ where approximately 41% of in-hospital adverse events occur, 50% of which are considered avoidable.¹ Miscommunication and poor teamwork associated with dysfunctional relationships between professional groups may contribute to errors in the OR.^{5,6} Analyses of errors that occur in surgery have highlighted the importance of interactions between team members and, specifically, their nontechnical skills (NTSs) in relating to and communicating with one another. Nontechnical skills are defined in relation to interpersonal (eg, teamwork, communication), cognitive (eg, decision making,

situation awareness), and personal resources (eg, coping with stress and fatigue) skills.^{7,8} In this article, we present an evaluation of a brief team training program relative to observed team performance (ie, NTSs), perceptions of team safety climate, and participants' reflections on its implementation.

PURPOSE

The purposes of this study were

- to evaluate the outcome of a brief team training program, coined TEAMANATOMY, including changes in teams'

observed NTSs and team members' perceptions of teamwork and safety climates; and

- to undertake a process evaluation to assess program participants' reflections after participation in the training program relative to feasibility, acceptability, fidelity, and transferability of TEAMANATOMY.

RESEARCH QUESTIONS

The following research questions addressed the outcome evaluation after implementing the TEAMANATOMY program:

- To what extent did the brief team training program improve team members' observed NTSs across surgical specialties?
- To what extent did the team training program improve surgical teams' observed use of the World Health Organization (WHO) Surgical Safety Checklist?⁹
- To what extent did the team training program improve team members' perceptions of the teamwork and safety climates?

The research question that addressed the process evaluation was

- What were the perceived barriers and enablers of feasibility, acceptability, fidelity, and transferability during program implementation?

SIGNIFICANCE TO NURSING

In many health care facilities, health care personnel have implemented team training interventions to address the need for improvement in teams' NTSs.^{10,11} Typical evaluation of such programs, however, is limited to assessing participants' experience relative to methods of delivery or teaching. Few team training interventions have been systematically evaluated relative to process and outcome measures. Moreover, many clinical interventions fail to translate into meaningful outcomes.¹² Evaluating complex interventions using outcome and process measures that assess the extent to which implementation is effective helps to optimize and translate the intervention into clinical practice.¹²

LITERATURE REVIEW

Effective teamwork, which is demonstrated by clear communication, consistency in workflow processes, and clinicians' familiarity with each other, can increase patient safety.^{13,14}

The link between teamwork and safety was first identified in civil aviation, where the principles of Crew Resource Management (CRM) training were widely credited for improving the safety of flying.⁷ Parallels between aviation and surgery have led to the use of CRM principles as a means of improving safety and reliability in the OR.⁸ Transferring

CRM principles to surgery is one way to enhance surgical teams' NTSs.

Professional organizations in Australia,^{15,16} the United States,¹⁷ and the United Kingdom¹⁸ recommend that staff members participate in communication training. This training could involve programs based on CRM principles, which are designed to develop NTSs in undergraduate curricula and hospital-based skills programs. These recommendations fall short, however, in providing guidance on how health care personnel may implement these training programs as part of nursing and medical curricula, or how they may introduce team training as part of OR orientation. Consequently, if health care personnel do not implement these programs, the novice learner has limited knowledge of the basic concepts that underpin CRM training and NTS performance.

Although teamwork training using simulation is considered useful in improving NTSs,¹⁹ there are barriers to its implementation in large perioperative departments. The notable challenges with adopting hospital-based NTS training programs in the OR department include

- limited viability given the need to meet surgical targets (ie, production pressure);
- engaging participants in the delivery of training programs using innovative methods;
- realizing demonstrable differences in teamwork behaviors, which may indirectly affect performance efficiencies; and
- scheduling the training, which requires considerable investment in time and effort to ensure interdisciplinary representation.^{7,10}

CONCEPTUAL FRAMEWORK

Surgical team training using CRM principles targets the components of NTSs (eg, communication and teamwork, task management, leadership, situational awareness [SA]), which lead to the optimal use of team and environmental resources.⁷ Focusing on NTSs through CRM training aims to increase team members' understanding of how certain situations may culminate in unsafe practices and provides tools and training for responding to demanding and often complex situations.⁸

In this study, we developed a brief program based on CRM principles; it centered on building SA and teamwork behaviors and included two complex but common scenarios for using the WHO Surgical Safety Checklist. The goal was to increase team members' knowledge, understanding, and awareness of the environmental factors that erode SA in surgery and to provide behavioral exemplars from credible sources.

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