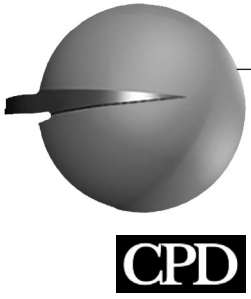

Implementing Ebp Column

Evidence-Based Competency Training Program for Blood Product Administration

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Key words
education/curriculum/learning, evidence-based practice, injury/trauma/wounds, intervention research, technology

ABSTRACT

Background: Health care in deployed military environments requires robust clinical nursing skills to care for patients with traumatic injuries. Blood product administration is a critical skill in which nurses should be competent. However, in non-deployed environments, blood transfusions are performed less frequently, resulting in skill competency loss.

Aims: Our clinical inquiry focused on maintaining competency for infrequently performed nursing skills, specifically blood product administration.

Methods: A literature review and critical appraisal were executed, followed by an evidence-based practice change. A knowledge test, objective and subjective assessment, and training satisfaction evaluation were performed to measure the practice change outcomes. Both inpatient and outpatient nurses were included.

Results: Sixteen articles were identified and appraised. The evidence recommended a blended education approach, that is, lecture plus hands-on practice. Thus, a classroom lecture and simulation scenario were put into practice with an existing computer-based training for blood administration. The nurses met knowledge test standards (≥ 90%) before and after implementation, while skill performance improved by 13% and improved self-competence scores by 7%. Nurses in outpatient settings improved performance scores by 18.4% compared to inpatient nurses, whose scores improved by 9.4%. The simulation scenario completion time decreased by 8.3 minutes post-implementation, and the training program earned a 90% satisfactory rating.

Linking Evidence to Action: A blended education program improves clinical skill performance and enhances confidence in performing critical interventions. Blended education provides a safe learning environment for nurses to be prepared for the management of low-volume patient care emergencies.

BACKGROUND

Health care in deployed military environments (e.g., war zones, disaster relief, humanitarian crises) requires robust clinical nursing skills to care for patients with traumatic injuries. Blood product administration is a critical skill in which nurses should be competent during peace, disaster, or war. United States combat operations revealed, "14% of patients admitted to combat support hospitals receive a transfusion of at least one blood product" (Cap et al., 2019, p. 3). In non-deployed environments, 86.5% of U.S. Air Force nurses work in ambulatory care clinics and do not regularly administer blood products (J. Putnam, personal communication, October 8, 2019). Over 6 months, blood products were transfused 35 times in the outpatient setting versus 334 transfusions administered in inpatient settings (P. Patton, personal communication, October 18, 2019). Moreover, nurses with recent deployment experience noted opportunities to improve the current practice for blood product administration training, which is a standard computer-based training (CBT). Therefore, our clinical inquiry focused on maintaining competency for infrequently performed nursing skills, specifically blood product administration.

PICO (Population, Intervention, Comparison, Outcome) Question

In nursing, how does knowledge-based learning compared to hands-on learning impact competency in blood product administration?

SEARCH STRATEGY

Keywords included: nurse, nursing, healthcare professionals, lecture-based learning, didactic, knowledge, e-learning, online learning, web-based learning, blood administration, blood transfusion, blood products, hands-on, skills, performance, simulation, and competence. The search yielded 161 peer-reviewed articles, of which 16 were relevant.

Critical Appraisal of the Evidence

Sixteen articles were critically appraised using the Helene Fuld Health Trust National Institute for Evidence-Based Practice in Nursing and Healthcare's Rapid Critical Appraisal tools (2020) for level and quality of evidence. The synthesis of the evidence recommended a blended education approach. The studies that compared different education methods (e.g., e-learning, simulation, workshops, and didactic lecture) reflected that hands-on skill performance consistently demonstrated superior outcomes (Aloush, 2018; Lutgendorf et al., 2017; Prentice & O'Rourke, 2013; Rafii, Amiri, Dehnad, & Haghani, 2016; Rhees et al., 2015; Rudrappan, 2019; Wong, Scott, Jones, Walzer, & Geller, 2016). For instance, a study by Rafii et al. (2016) found no significant improvement in skills when training included just a lecture. Yet, lecture plus hands-on practice yielded a significant improvement in participant knowledge and skills performance. Investigators that implemented a simulation exercise learned that participants felt better prepared to deal with critical events due to the realistic staging, session debriefings, and reflective writing assignments (Rhees et al., 2015).

Integration of the Evidence With Clinical Expertise and Participant Preferences

The evidence-based practice change involved adding a classroom lecture and a simple and realistic simulation scenario, appropriate for any type of medical facility, to the existing knowledge-based CBT for blood administration. We engaged stakeholders and secured their buy-in, and obtained leadership support and Institutional Review Board approval.

Lecture

The classroom lecture included a PowerPoint presentation that summarized the clinical indications and steps for blood product administration. The lecture integrated current guidelines and critical performance elements from the CBT to ensure consistency with the simulation scenario.

Simulation

To develop the simulation scenario, we contacted military and civilian medical modeling and simulation centers, industry, and academia in search of a turnkey product. Two simulation scenarios were identified, and only one was selected for use as it was more aligned with the planned education change. The scenario chosen provided an effective simulation-based experience that incorporated learning objectives, real-world situations, and debriefing sessions as recommended by the International Nursing Association for Clinical Simulation and Learning Standards Committee (2016) and Waxman (2010). The contents of the procured simulation scenario were modified and subsequently reviewed by a certified healthcare simulation educator.

Implementation

Before implementation, the team completed practice runs with feedback from clinical nurse specialists, blood bank technicians, simulation operators, and volunteer participants. Once refined, we formally implemented the education change with 32 active-duty nurses as part of clinical pre-deployment training.

Outcomes

Measured pre- and post-outcomes included: knowledge (CBT test), performance (objective skills assessment), self-competence (blood transfusion self-assessment), and training satisfaction.

Both inpatient (41%) and outpatient (59%) nurses were included. The nurses met knowledge test standards (≥90%) before and after implementation, while skill performance improved by 13% and self-competence scores increased by 7%. Nurses in outpatient settings, where blood transfusions are performed roughly 9% of the time, improved performance scores by 18.4% compared to inpatient nurses, whose scores improved by 9.4%. The simulation scenario completion time decreased by 8.3 minutes post-implementation, and the training program earned a 90% satisfactory rating.

Dissemination

The initiative was accepted for presentation at the TriService Nursing Research Program Research and EBP Dissemination Course 2020 and the 2020 International Armed Forces, Veterans, and their Families Research Conference. Additionally, the initiative was featured in the organization's annual clinical inquiry symposium. Finally, an evidence-based Blood Product Administration Simulation Training toolkit is available, and local policy development is underway to initiate and sustain its implementation across the Military Health System.

LINKING EVIDENCE TO ACTION

- A blended education program improves clinical skill performance and enhances confidence in performing critical interventions.
- Blended education provides a safe learning environment for nurses to be prepared for the management of low-volume patient care emergencies.

DISCLAIMER

This project was sponsored by the TriService Nursing Research Program and the Uniformed Services University of the Health Sciences. However, the information/content and conclusions do not necessarily represent the official position or policy of, nor should any official endorsement be inferred by, the TriService Nursing Research Program, the Uniformed Services University of the Health Sciences, the Department of Defense, or the U.S. Government. **WVN**

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