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Assessing Nursing Deployment Readiness-A Literature Review

The University of San Francisco, School of Nursing and Health Professions

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Assessing Nursing Deployment Readiness-A Literature Review

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ABSTRACT.

Air Force nurses must be prepared for deployment to support military missions on short notice. During deployments, they may be asked to practice in demanding and austere wartime environments. The required competencies for deployment include the care of multi-trauma patients, military vehicles and aircraft, mass casualty care, and military-specific skills. Many Air Force nurses work in low acuity roles and do not maintain the clinical competency and skills necessary if called upon to deploy. A deployment notification may happen with little notification, limiting the opportunity for a quick “ramp-up” of critical skills. Maintaining deployment and clinical readiness is an ongoing challenge. The literature supports military-civilian training collaborations as beneficial in allowing familiarization with treating the types of injuries they may encounter during deployment. Does the current nursing training regime prepare military nurses for deployment?

INTRODUCTION

A state of individual preparedness for military deployment is a primary concern for the U.S. Air Force Medical Service. Beginning in 1999, the Department of Defense Medical Readiness Strategic Plan stated that its personnel must be prepared to respond quickly and move rapidly and decisively anywhere on the globe when called to do so (Department of Defense, 1999). A heightened importance of readiness was brought to the forefront when terrorists destroyed the World Trade Center in New York City on September 11, 2001. This occurrence of aggression in our nation has resulted in a declaration of war on terrorism (Cowley et al., 2001). It has increased short-notice, worldwide deployments, Operation Enduring Freedom (OEF) in Afghanistan, and later Operation Iraqi Freedom (OIF) in Iraq (King et al., 2005). The lessons learned in Afghanistan and Iraq have led to the development of numerous clinical practice guidelines for deployed medical personnel caring for trauma patients at the various echelons or roles of care (Lane et al., 2018). Since 2001, US military forces have been engaged in Afghanistan and Iraq. During the fifteen years of conflict in both operations, US troops have incurred a total of 52,022 wounded and 6,857 deaths (US Department of Defense, 2015). From 2001 to 2015, 6,326 nurses were deployed; 3,296 were deployed to Afghanistan and 2,683 to Iraq (Berry-Caban et al., 2018). Deployment is the rotation of military forces into and out of an operational area. Most nurses deployed did not have ED or critical care experience and were classified as general nurses (66.6%) (Berry-Caban et al., 2018). Nurses may be assigned roles not matching their expertise, as deployment assignments are based on the facility's needs. There is no standardized pre-deployment medical training for nurses to prepare them for deployment.

Military nursing practice is based on the premise that the nurse will be ready to mobilize to a stateside location or deploy overseas on short notice. This competency is called deployment readiness. Deployment competencies include providing complex patient care in a hostile environment, sometimes with minimal resources and often with makeshift equipment. Skills in chemical/biological protection and special deployment equipment, such as mobile hospitals, tents, and patient transport devices, are also part of deployment readiness training. In contrast to most civilian nurses, the military nurse must develop skills in caring for severely injured, multi-trauma combat victims.

Readiness is generally used to describe the level of preparation nurses have that enables them to fulfill their wartime and disaster-relief patient care missions. A basic paradigm of military nursing is evaluating readiness competency and ongoing training. Validation of military nursing readiness competencies has been conducted in several studies using the Readiness Estimate and Deployability Index (READI) instrument (Reineck et al., 2001), the Operational Nursing Competencies checklist (Bridges, 2009), and the Emergency Preparedness Information Questionnaire (EPIQ) (Garbutt et al., 2008). These instruments measure the competencies of military nurses to assess training needs and skill profiles.

In addition to the military nurse's general preparedness for patient care, each branch of the military service has unique nursing roles that demand high proficiency in a distinct set of competencies. Air Force flight nurses, for example, set up facilities and provide care in fixed-wing cargo aircraft. Military aircraft have multipurpose designs so nurses and medical technicians can convert an airplane that drops paratroopers or hauls cargo to carry patients. There is no equivalent civilian nursing role.

A significant issue is nurses working in roles that do not utilize deployment skillsets. A deployment notification may happen with little notification, limiting the opportunity for a quick “ramp-up” of critical skills. Many nurses may not have experience caring for combat types of injuries. A study of injuries sustained during wartime revealed that injury severity scores were considerably higher than those seen at civilian hospitals (Peleg et al., 2004). Injuries in conflict produce a pattern of injury not seen in routine civilian practice (Ramasamy et al., 2009). During 12 months in 2006-2007, the Air Force Theatre Hospital in Balad, Iraq, admitted 3,637 patients. Of these admissions, 34.5% were the result of gunshot wounds, and 50.6% were the result of blast injury from improvised explosive devices (IED), mortars, or rocket-propelled grenades (Maureen, 2011). The remaining 14.9% were miscellaneous injuries where blunt mechanisms, such as motor vehicle collisions and falls, predominated. Although there are differences between civilian trauma and combat injuries, the literature is consistent in supporting military-civilian training collaborations as beneficial in allowing familiarization with treating the types of injuries they may encounter during deployment (Wiggins et al., 2020). Schulman et al. (2008) compared the patients treated at a Combat Support Hospital in Iraq and a U.S. Level I trauma center. Although the centers treat significantly different patient populations, the operations performed and outcomes were similar.

METHODS

After consultation with an academic librarian, a literature search was conducted using the CINAHL, PubMed, and Cochrane Database within the University of San Francisco’s Gleason Library. The initial literature review for this project search used individual terms such as military nursing, nursing competency, critical care competency, and training at trauma centers. Searches were conducted using the application of Boolean Operators of *Air Force* OR

*military nursing*OR *RN refresher* OR *Simulation AND trauma OR *high acuity*. One hundred and twenty-two titles were scanned for relevance. Inclusions were studies from 1990-2023, all peer-reviewed systematic reviews, meta-synthesis, critically appraised research, and individual studies. The evaluation of the best evidence of clinical training and deployment readiness was conducted using the Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) tools, specifically Appendix D (level and quality assessment guide), Appendix E (research), and Appendix F(non-research) to assess each study's level of evidence and quality (Dang, 2022).

RESULTS

The primary theme identified during the literature review was the positive reaction to the various training (military and civilian) options reviewed (Bruce et al., (2003), Garvey et al., 2016; Surush et al., (2021), Thorson et al., (2012), & Wiggins, et al., (2020) (Table 1). The various training options (Centers for the Sustainment of Trauma and Readiness Skills (C-STARS), Tactical Combat Casualty Care (TCCC), Army Military-Civilian Trauma Team Training (AMCT3), and other military clinical trauma programs) were well received by the training and study participants. Self-reported perceived improvement in deployment readiness was noted (Maureen et al., 2011; Schulman et al., 2010; Surush et al., 2021). A one-month training experience at a civilian trauma center provided military nurses with a more significant trauma experience than they received in one year at their home station in the study by Schreiber et al. (2002). The assessment of the military-civilian training collaborations, evaluated in ten primary studies (six case studies, three opinion papers, one clinical report), were consistent in their positive reviews highlighting the training environment. Challenges were noted in simulating training to match what could be expected in a forward-deployed environment (Garvey et al., 2016; Maureen et al., 2011; Murray et al., 2019 & Stieneman et al., 2011). The

environment and severity of combat injuries are unique, and accurate analog training options are limited. First-person case reviews were the most common and added valuable insight into the types of injuries and the unique challenges faced while working in a deployed environment. During deployment, nurses were often assigned roles with limited experience (Garvey et al., 2016).

An additional theme noted was the need for clinical assessment before deployment. A few assessment tools were identified in the studies by Bridges et al. (2009), Garbutt et al. (2008), and Reineck et al. (2001), and they are not included as part of any current military deployment readiness programs. The studies by Kraemer et al. (2008), Maureen et al. (2011), and Pruitt et al. (2006) confirm there is a critical knowledge gap in the pre-deployment training paradigm of military nurses and Suresh et al. (2021), highlighted the need for the data to guide future training efforts.

In the 2006 study by Rivers et al., a Level IV evaluation was conducted of the U.S. Army Professional Filler System personnel regarding nursing competency and readiness for deployment. The key finding in the study was a significant need to improve core competencies for deployment readiness. The study assessed the Army process for measuring readiness for medical providers but was not designed for military nursing practice. It was a step in the right direction of identifying key elements necessary for deployment and evaluation. However, it was not intended for nursing practice.

Reineck et al. (2001) developed the Readiness Estimate and Deployability Index (READI) to assess the readiness of Army nurses to deploy. Reineck used the dimensions of individual readiness, clinical competency, operational competency, and soldier/survival skills to develop, test, and revise the READI. The original READI is an instrument that evaluates the

individual readiness of Army Nurse Corps personnel. Those authors defined personal readiness as a dynamic concept with individual, group, and system dimensions. These dimensions influence individuals' ability to prepare for and to accomplish the mission. Using standard test development, Dremsa et al. (2004) broadened Reineck's work to develop the READI-R-AFN. Dremsa modified this instrument for use with Air Force nurses, yielding the Readiness Estimate and Deployability Index Revised for Air Force Nurses.

In the case study by Wiggins et al. (2020), data was collected during the two-week trauma training course. Long-term reactions to the training program post-deployment to Iraq or Afghanistan using the analysis, design, development, implementation, and evaluation (ADDIE) instructional design framework, which focused on the design of the instruction to be purposeful and geared toward a learner-centered approach. In total, 87% of medical technicians and 92% of the registered nurses completed their training in one year. A total of 38 medical technicians and 22 registered nurses completed the training. Out of the 38 medical technicians, 12 were found to need additional support, with such factors requiring remediation for lack of confidence, organization, and need for knowledge expansion. These individuals were recycled through the scenario and provided additional opportunities to improve their knowledge, ask questions, and develop a more organized style and approach. Participants were asked to complete the Debriefing Assessment for Simulation in Healthcare (DASH) tool, which assesses the different strategies and methods used to debrief after a simulation activity. The training participants verbally stated they enjoyed and valued the training and provided overwhelmingly positive comments when completing the DASH survey. Questions were broken down into two areas: reactions to experiences in the resuscitation unit and reactions to the amount of patient contact. Overall, the quantitative responses were highly positive. Finally, approximately 90% of

respondents agreed that Ryder Trauma Center faculty/physicians were available to answer questions, and less than 40% would have liked greater access to Ryder staff. The following questions focused on trainees' reactions to the patient contact experience during their 2-week training program. Like their resuscitation experience, most trainees agreed or strongly agreed that the patient contact experience was sufficient (78.5%). In addition, almost 90% agreed or strongly agreed that the patient contact experience was a good learning opportunity, and over 80% felt that the experience was a good opportunity to apply what they had learned in their classroom training. Qualitative responses, in addition to quantitative questions, survey respondents were also asked open-ended questions about their experience during the 24-hour capstone event and what they thought could be improved. Overall, positive responses outweighed negative responses, with approximately 60% of respondents providing positive feedback. Several trainees felt the experience was excellent overall, especially for nurses and medics.

The descriptive, cross-sectional study by Suresh et al. (2021) used an online survey to conduct the surveys. Eligible individuals met the following inclusion criteria: 1) age 18 years or older, 2) currently serve or served in the U.S. Army, 3) were a nurse when deployed, 4) were not a prisoner of war or detainee, 5) deployed to a combat zone on or after 2001, and 6) willing and able to complete a survey about their most recent deployment experience. The target population for this study included Army nurses (medical/surgical, emergency, critical care, nurse anesthetist, or licensed vocational nurse) from the Active and Reserve components who had deployed. There were 246 nurses who responded. Most nurses (n = 132, 53.7%) reported being evaluated for clinical competency before deployment. Standard courses and topics included Tactical Combat Casualty Care, Advanced Cardiac Life Support, cultural awareness, and trauma

care. When asked about the quality of their pre-deployment training, most nurses (n = 186; 75.6%) indicated that their training was adequate or better. Nearly all nurses and medics reported being moderately confident or better (nurses n = 225) and moderately prepared or better (nurses n = 223; 90.7%) in their ability to provide combat casualty care. When asked if they participated in a team-based evaluation of clinical competence, many nurses (n = 121, 49.2%) reported not attending a team training program.

In the study by Wiggins et al. (2020), a qualitative evaluation was conducted on military nurses who completed a two-week trauma training course at a civilian trauma center. Of note, the assessment included reactions to the program after deployment to Iraq and Afghanistan and were consistently positively related to the training. In the descriptive study by Garvey et al. (2016), nurses who completed the “Trauma Tactics” program significantly increased confidence, trauma knowledge test scores, and simulation performance scores. The program was a short course at a civilian trauma center focusing on high-fidelity human patient simulation.

In the Level III study by Thorson et al. (2012), a survey was conducted of 130 U.S. Air Force nurses who completed the civilian-military training program at the Ryder Trauma Center located at the University of Florida. Over 90% of respondents surveyed stated that the training was beneficial, was a helpful learning opportunity, and allowed them to apply classroom training. The information was inciteful since the respondents had all recently completed a deployment.

In the study by Schulman et al. (2010), they describe how simulation training provides opportunities for repeated exposure to complex scenarios, which provides opportunities to identify and correct gaps in knowledge skills. The study validates that simulation can help develop new knowledge and operational nursing skills before practicing on live patients. A

study by Murray et al. (2019) also identified that simulation training in an appropriate environment can offer real experience and has the added benefit of improving team skills and communication, which is essential for managing critical trauma patients.

Stieneman et al. (2011) validated that a relatively brief four-hour simulation curriculum can improve multidisciplinary trauma teams' teamwork and clinical performance. This improvement was evidenced both in simulated and actual trauma settings.

Table 1. Studies that Address Deployment Readiness

Reference	Sample Size	Aim of Study	Type	Conclusions	LOE*
Bruce et al., (2003)	320 Nurses 320 military nurses: Army FST, Navy FST Air Force CCATT, Special Operations Army Rangers.	Evaluation of two training initiatives designed to prepare and evaluate military nurses for deployment.	Case Study	The two programs did ensure nurses were prepared to respond to diverse medical situations worldwide.	V A/B
Linde et al., (2018)	5 DoD Medical Simulation Programs	Review of current programs measure skills decay.	Mets-Synthesis	Only 3 of 5 programs were effective in identifying skills decay.	III A/B
Murray et al., (2019)	189 Nursing Students	Evaluation of simulation training used during disaster response training.	Case Review	Highly successful apply classroom knowledge in real life situations.	III A/B
Rivers et al., (2006)	131 Military Nurses	Evaluation the U.S. Army Professional Filler System related to deployment readiness.	Case Review	Significant issues identified. Need for improved assessment tool.	III A/B
Schulman et al., (2008)	142 Medical Records	Overview of critical care nursing in current battlefield healthcare environments.	Retrospective Case Review	High quality care was provided at AF Theatre Hospital	V/C
Thorson et al., (2012)	3 military-civilian collaboration training sites	Case review of the Air Force Centers for the Sustainment of Trauma and Readiness Skills (C-STARs) program	Case Review	All of the C-STARs collaborations were successful. Each developed effective training pertaining to combat casualty care.	III A

*LOE: Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) tools, (Dang, et al. 2022)

DISCUSSION

The studies selected highlight the value of military-civilian training collaborations, deployment assessment tools, and simulation training to support readiness. A consistent theme in the literature was the challenges associated with training to treat combat injuries. The environment and severity of combat injuries are unique, and true analog training options are

limited. The assessment of the military-civilian training collaborations was consistent in their positive reviews highlighting the training environment. However, there needed to be more in evaluating the training as it relates specifically to deployment readiness. The three case studies of deployment readiness assessment tools highlighted the value and challenges in accurately assessing deployment readiness status. The benefits of training at high-acuity trauma centers were well-documented for military providers. However, information related to military nursing practice was limited (Kelly et al., 2006).

A frequent element identified in the literature was the benefit of the civilian-military physician training collaborations, allowing military personnel to train at civilian trauma centers caring for patients with injuries similar to those they would see in forward-deployed medical facilities (Bridges, 2006; Gawande, 2004).

FUTURE DIRECTIONS

The U.S. military has undertaken a congressionally mandated preparedness training program for medical personnel in each Armed Forces. Military healthcare providers train at one of several top-level trauma centers in the U.S. before deployment to a war zone (Bruce, 2003). This training may have contributed to decreased war-related deaths in recent conflicts. The wars in Afghanistan and Iraq have created a significant body of new information on the optimal management of patients suffering combat injuries. Multiple factors, such as immediate evacuation of the injured and advancements in care, have led to the continued improvement in patient outcomes. The benefit of the physician civilian-military trauma training programs was well documented, leading to a significant change in annual competency requirements (Bridges, 2006; Eastridge et al., 2009; Thorson et al., 2012). However, there is still a need to evaluate the effect of trauma training on military nurses and how it impacts deployment readiness (Thorson et

al., 2012). Multiple variables, such as frequency, length, and training based on current skill sets or gaps, are still worth continued study. Effective curricula development for training before deployment zones depends upon practical evaluation and assessment of existing programs (King et al., 2006).

CONCLUSION

The War on Terrorism, Operation Enduring Freedom (OEF), and Operation Iraqi Freedom (OIF) have exposed nurses to situations and challenges for which many report feeling unprepared, particularly in terms of caring for those with multi-trauma injuries and devastating wounds suffered by military troops and civilians alike (Agazio et al., 2017). Years of sustained conflict have caused the narrative to change, no longer supporting last-minute refresher training but validating the need for ongoing sustainment of critical life-saving trauma skills (Schulman et al., 2010). The Air Force has modified its training expectations for their nurses based on substantial evidence learned through recent wars. The paradigm shift, from just “training up” before deployment to requiring a higher and sustained level of trauma skills, was well represented in the literature with strong supporting evidence. Effective curricula development for training nurses before deployment to conflict zones depends upon evaluating and assessing current programs (King et al., 2006). Although the training is accepted as beneficial and is an easy assumption to make, defining how the training has improved deployment readiness requires further evaluation.

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