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A PROPOSED MODEL FOR MILITARY DISASTER NURSING

There is a dearth of literature examining models related to nursing disaster preparedness and response, particularly in military nursing. Several recent articles address lessons learned by nurses who worked through wars and disasters, and these experiences can be used as a basis for a proposed model of military disaster nursing. This article will (a) review the literature about disaster nursing, including general disaster responses by nurses, disaster responses in military nursing, and research about military nurses and disaster response, (b) describe the uniqueness of the military environment, and (c) propose a model for military disaster nursing that can be evaluated for future implementation. Research about individual nurse readiness for deployment during disasters is also incorporated into the proposed model. Future research is needed to test the model and examine its relevance to military, as well as civilian, nursing for future disasters.

Key words: disasters; floods; military; mass casualties; nursing; preparedness; terrorism; training; triage; war

Real time communications, instant media access, and rapid, long-distance travel contribute to today's global society. A disaster occurring in one part of the world is no longer an isolated event. People from many countries quickly become disaster victims, and those who respond as rescuers come from all over the world.

Disasters significantly jeopardize international public health. The World Health Organization defines disaster as a "situation where the normal means of support and dignity for people have failed as a result of natural or manmade catastrophe" (WHO, 2002, p. 1). Often the disaster causes extensive morbidity and mortality with damage to property, especially homes, health care facilities, and vehicles. Transportation routes and communication networks are seriously damaged and further compromise rescue operations (Cox & Briggs, 2004). Due to tremendous destruction and loss, local communities are unable to respond effectively to victims; and additional help is required from external sources. Outside rescuers must stabilize the immediate situation before full assistance, rescue, and recovery operations can

begin.

For years, major sources of concern have been natural disasters, such as floods, hurricanes, blizzards, and tornados, and manmade disasters in the form of war. Fears became heightened as a result of the September 11, 2001, terrorist attacks. Terrorists bring attention to their own demands by causing the greatest possible amount of destruction and loss of innocent lives (Department of Homeland Security, 2006). Mass casualties result from the use of traditional and nontraditional weapons of mass destruction including chemical, biological, and nuclear weapons. There is now an overwhelming urgency for disaster preparedness in order to respond and manage effectively in the event of terrorism as a disaster.

There is a dearth of literature examining models related to nursing disaster preparedness and response, particularly in military nursing. Several recent articles address lessons learned by nurses who worked through wars and disasters. The experiences of these nurses can serve as a basis for the model of military disaster nursing proposed in this article. The article will (a) review the literature about disaster nursing, including general disaster responses by nurses, disaster responses in military nursing, and research about military nurses and disaster response, (b) describe the uniqueness of the military environment, and (c) propose a model for military disaster nursing that can be evaluated for future implementation. Research about individual readiness for deployment during disasters is also incorporated into the proposed model. Future research is needed to test the model and examine its relevance to nursing in preparing for military as well as civilian disasters in the future.

A Review of the Literature

The literature about disaster response in nursing is generally fairly inclusive and comprehensive; however, there is less information published about disaster responses geared toward military nursing. Anecdotally, it is clear that military nurses are readily available in the event of war as a manmade disaster, but there is a dearth of research describing models for military disaster nursing, their implementation and evaluation. This section of the paper will review general disaster responses by nurses, responses to disasters in military nursing, and research describing the experiences of military nurses during natural and manmade disasters.

General Disaster Responses by Nurses

Nurses are full participants and key players in disaster response efforts. A holistic educational background and approach to nursing practice prepares nurses to integrate all aspects of disaster care whether it is of a physiological, psychological, or spiritual nature (Bridges, 2003; Hinton Walker, Bibb, & Elberson, 2005; Hinton Walker, Ricciardi, & Agazio, 2003; Mandy, 2005). Disaster nursing involves a systematic application of knowledge and skills specific to disaster situations as well as implementation of activities that minimize health hazards and life threatening damage caused by disasters (Gebbie & Qureshi, 2002; Veenema, 2003). The work of disaster nursing is performed in collaboration with many other specialized disciplines, yet concepts fundamental to all of nursing practice assist with disaster preparedness and response and include a focus on prevention, treatment, caring, advocacy, and education (Cox & Briggs, 2004). Nurses need to be present at the disaster preparedness planning tables examining and creating policies and procedures for disaster response.

The disaster nursing literature typically addresses specific details about nursing care of pregnant women and children, the management of trauma and burn patients, and the potential hazards of nuclear, biological, and chemical disasters. Many articles and chapters found in disaster nursing manuals describe specialized disaster nursing care; yet very few global models exist to guide general nursing disaster preparedness and response.

Demi and Miles (1984) have, however, outlined a theoretically based conceptualization of nurse leadership during the three major phases of disaster: (a) preimpact, prior to the actual onset of disaster; (b) impact, including the disaster strike followed immediately by rescue efforts; and (c) post-impact, where rescue efforts were finalized and recovery and rebuilding tasks occurred over a long-term period of time. The authors integrated nursing leadership principles with

steps of the nursing process throughout all disaster phases. Goal setting and goal achievement provided overall guidance for assessment, planning, intervention, and evaluation.

Emergency preparedness core competencies for nurses were developed by Gebbie and Qureshi (2002) following the terrorist attacks of 2001. The competencies are valuable for preparing nurses in the event of disaster. Highly practical knowledge and specific skills are addressed as competencies; they include identifying the chain of command; knowing the agency's emergency response plan and performing regular drills; using correctly emergency equipment, such as personal protective equipment; following communication roles and channels; and participating in the evaluation of drills and modifying of the response plans as necessary.

The only true disaster nursing "model" identified in the literature was developed by Jennings-Sanders (2004) as a framework for disaster preparedness and response to guide curriculum in nursing educational programs. This model enlarges upon the tasks and roles of nurses during the three phases of disaster and adds a fourth phase examining patient/community outcomes related to mortality and morbidity rates, health status, knowledge, health care costs, disaster-related costs, collaborative efforts, team relationships, and the overall effectiveness of disaster plans.

A general model of disaster nursing is needed to guide expectations and preparations for disaster and mass casualty events that often involve long working hours, personal and intense emotional responses, and austere working and living conditions. General principles and processes within the phases of disaster should be examined for role adaptation, thus allowing for application of specialized nursing knowledge, whether it is in administration, infection control, psychiatric-mental health, medical-surgical, critical care, operating room, emergency/trauma, or pediatric care.

Manmade and natural disasters occurring since September 11, 2001, have been very destructive and severe in nature. They have resulted in mass casualties, severe traumatic injuries, and biological threats requiring the potential use of decontamination and personal protective equipment. At times the safety of rescue personnel was seriously threatened and the potential for post-traumatic stress in victims, as well as in rescuers, became a reality. Typically these are the characteristics of military actions but now they characterize civilian homeland defense and global security activities as well. Thus, a military model of disaster nursing can be applicable to both military and civilian disaster preparedness and response. This article will propose a model of military disaster nursing.

Disaster Responses in Military Nursing

Throughout the past century, U.S. military nurses paved the way for future nursing response to disasters. During the Spanish American War, American Red Cross nurses heeded the call to service and established a basic structure and organization that became the Army Nurse Corps in 1901 (Mandy, 2005; Sarnecky, 1999). Since that time, nurses as officers in the U.S. Army, and later in the Navy and Air Force, through the active duty and reserve military components, responded to manmade disasters in the forms of war; operations other than war, such as peace-keeping missions; and terrorist attacks (Sarnecky & Cox, 2001; Yoder & Brunken, 2003). Military nurses were also mobilized to sites of natural disasters, most recently with the tsunami response in Southeast Asia and with the hurricane rescue efforts in the southern U.S. states of Mississippi and Louisiana (Connelly, 2006; Stodart, 2005).

The wartime mission of the U.S. military medical and health care system is to support combat commanders in their military missions by "conserving the fighting strength" (Department of Army, 1997). Responsibilities include evacuating the wounded away from the battle; saving life, limb, and eyesight; sending the severely injured back to higher levels of definitive care; and returning the less injured to duty as soon as possible. The current, global geopolitical environment creates a need for homeland defense as well. Peacekeeping, nation building, and the protection of humanitarian missions throughout the world are often additional responsibilities assigned to the U.S. military. These activities increase the operations tempo of military actions with requirements for rapid and frequent deployments of personnel. Active and reserve components of the U.S. military must respond quickly to mobilization on short notice and move out to areas of worldwide conflict (see sidebar based on the work of Mandy [2005] and Ruble et al. [2005] for a quick synopsis of

military involvement since the Spanish American War).

Research about Military Nurses and Disaster Response

Research regarding the history of military nurses provides insight into the reactions and concerns of nurses as they experience disasters. The nurses' preparation requirements are examined for relationships to future emotional reactions, challenges, and planning for disasters. Current knowledge about military nursing in disasters comes mainly from personal accounts of nurses working as health care providers on the battlefield, in the air, or on the waters during war (Boren, Forbus, Bibeau, McKenzie, & McKinsey, 2003; Bridges, 2003; Duncan et al., 2005; Hough, Sadler, & Patrician, 2003; McLarnon & Wise, 2003; Nelson & Hagedorn, 1997; Sarnecky, 1999; Scannell-Desch, 1996, 1999, 2000a, 2000b, 2005; Schmelz, Bridges, Duong, & Ley, 2003; Stanton-Bandiero, 1998).

Dittmar, Stanton, Jezewski, and Dickerson (1996) interviewed 22 military nurses who served in conflicts from World War II to Operation Desert Storm. The nurses reported sights, smells, and sounds of war that were pleasant, unpleasant, or horrible. Pleasant remembrances included rest and recreation opportunities, holidays, and close friendships with colleagues. Unpleasant memories focused on austere living conditions, difficult travel throughout the local countryside, and food. Horrible sights, smells, and sounds revolved around patient care, responses to dying soldiers, the sound of helicopters or trucks bringing in large numbers of wounded, and all memories associated with combat. The authors found that three of the nurses were receiving current psychotherapy as follow up to these experiences and two other nurses demonstrated signs and symptoms of post-traumatic stress disorder (PTSD). Organized knowledge of the nurses' shared experiences was recommended for the development of interventions to prevent mental and emotional trauma and facilitate "reintegration into civilian life" (p. 79).

A qualitative study of nurses who served in Vietnam identified many experiences and lessons learned related to wartime (disaster) nursing efforts (Scannell-Desch, 1999; 2005). Circumstances, images, personal meanings, and recommendations for the "next generation of military nurses who may have to go to war" were well outlined and analyzed (p. 35). Nurses once again identified the visions, smells, sounds, and thoughts that they brought home from Vietnam. Six major factors affected the nurses' impressions and responses after returning home from the war and included (a) the volume of casualties, (b) the extensive and severe injuries suffered by young soldiers, sailors, and airmen, (c) the young ages of military patients, (d) austere living conditions, (e) the nurse's youth and clinical inexperience, and (f) sleep deprivation. Nurses worked long hours and endured the discomforts and lack of resources found in very bleak working and living conditions. Fears for their own safety and the safety of patients and friends added to permanent marks left on their memories. Recommendations mainly addressed preparation and training to deal with the painful and long-lasting emotional responses to catastrophic events. Individual training and personal readiness for disaster and war were emphasized.

The Unique Military Nursing Environment

The proposed model for military disaster nursing first takes into account the unique environment in which military nurses provide patient care. During wartime, nurses work in hostile environments, often under enemy fire. Large numbers of patients are processed through the field hospitals and resources are very limited. Often the focus is patient survival with very little time left to provide comfort care; in other words, the precious amount of time available is spent on lifesaving and stabilization to move patients from temporary field hospitals to more sophisticated, permanent structure hospitals and definitive care. All branches of the military, Army, Navy, and Air Force, now have field hospitals for patient lifesaving and evacuation; however, in addition, the Army supports larger, fixed facility structures to provide definitive medical treatment and nursing care, while the Navy has its hospital ships, and the Air Force has responsibility for evacuating patients using flight hospitals in fixed wing aircraft where intensive care is provided until the patient reaches a more permanent care facility. Much of military nursing in these settings is characterized by the independent and autonomous nature of the work. Military nurses are often the leaders of patient care teams with general knowledge of management and organization of patient care in addition to their finely honed clinical skills. Military nurses must also be multitasked with cross-training for skills in resuscitative care and trauma care, and with a certain amount of expertise in pediatrics,

obstetrics, and nonbattle disease processes. Combat nursing requires flexibility and tolerance for ambiguity, as well as tolerance for the many changes involved in coordinating dozens of units and troops in a theater of operations. Expert levels of decision making and exquisite communication skills are also needed (Mandy, 2005).

A large part of military nursing involves training in disaster/mass casualty response according to the NATO categories of triage (Bowen & Bellamy, 1988; Duncan et al., 2005; Janousek, DeLorenzo, Jackson, & Coppola, 1999; Taft, 2003). Military triage is founded on the principle of providing the greatest amount of good for the greatest number of people within the confines of limited resources. Military triage categories include: (a) immediate, life-threatening, moderately severe injuries that are treatable with a minimum amount of time, personnel, and supplies; (b) delayed, where the patient is not at risk for losing life, limb, or eyesight, and treatment can be delayed until time, personnel and resources are available; (c) minimal, where minor treatment is required and patients are usually ambulatory; and (d) expectant, when patients' injuries are severe and require extensive treatment that exceeds time, personnel, and resources.

A Model for Military Disaster Nursing

A model for military disaster nursing is proposed according to the three phases of disaster (Jennings-Sanders, 2004; Veenema, 2003). The Figure, developed by this author, provides a summary of priority activities for military nurses during each disaster phase.

Disaster Phase 1: Preparedness/Readiness

The first disaster phase is designated as pre-disaster, or pre-impact, and focuses on prevention, protection, and preparedness. During this phase, intensive training occurs, an assessment of resources is performed, and disaster response plans are developed and practiced. The focus of today's military is training for defense and protection of the country against threats of war and terrorism. Training for preparedness, or what the military calls readiness, constitutes a large portion of this phase. Many authors consider Phase 1 to be the most important phase in terms of planning for disaster response and assuring the best possible outcomes despite the actual impact of disaster. A general model of military disaster nursing is directly influenced, shaped, and produced as a result of examining the pre-impact, prevention, and preparation phase, before disaster strikes.

Reineck (1999) conducted a qualitative study to clarify the concept of deployment readiness and disaster/war preparedness. Thirty previously deployed military nurses participated in three separate focus groups over an eight month period of time and defined readiness as "a dynamic concept with dimensions at the individual, group, and system levels, which, together, influence one's ability to prepare to accomplish the mission" (p. 931). Readiness refers to a state of always being prepared for deployment to the location of disasters and wars.

Reineck's study (1999) also identified six components of readiness that include (a) personal, psychological, and physical readiness, (b) clinical nursing competency, (c) operational competency, (d) soldier/survival skills, (e) leadership and administrative support, and (f) group integration and identification. These six components served as a conceptual foundation for developing an instrument to measure readiness called the "Readiness Estimate and Deployability Index, or READI" (Reineck, Finstuen, Connelly, & Murdock, 2001).

The six components of readiness (Reineck, 1999) can be divided into a three-tiered program of training that should be conducted during the preparedness phase of the military disaster nursing model. The three tiers of training are focused on individual, clinical, and unit/collective readiness.

The first level of individual training includes the physical, psychological, and personal readiness component (Reineck, 1999). Individual readiness revolves around physical fitness training to prepare for long work hours, manual labor, and lack of sleep. To describe the deployment living and working conditions as austere is an understatement. Often the deployed facility environments lack doors, windows, water, and electricity, except for that produced by generators with their inherent power surges. Military nurses come to understand that the rigors and demands of these environments are

a way of life and not just part of the job.

Emotional preparation is an integral part of individual readiness. Nurses need to face the reality that they will see young men and women die or be horribly maimed as a result of war. In disaster and wartime conditions, nurses should be prepared to expect the unexpected, learn to tolerate ambiguity, confusion, rapid change, and remain as flexible and positive as possible. Nurses need to understand that there will be very little free, personal time, no privacy, and lack of sleep in uncomfortable, dangerous living conditions. During this preparatory period, a forum for nurse sharing and guidance should be provided for examining abilities, talents, and limitations; developing coping skills; freeing emotions; finding support as needed; and learning to recognize and seek help for feelings of guilt, doubt, or depression. Finally, personal readiness also involves preparation for family and financial support upon deployment.

The first tier of individual training also includes the soldier and survival skills component of readiness (Reineck, 1999). Nurses need to be trained in the use of weapons, particularly the M-16 rifle and the 9-mm pistol, for defense of self and patients. Personal protection against chemical and biological weapons is learned through the use of mission-oriented, protective-posture equipment (MOPP). Familiarization with other soldier skills includes land navigation with maps and compasses, field sanitation, and the use of communications equipment.

The second tier of training involves Reineck's clinical competency readiness component (1999) and refers to obtaining appropriate technical proficiency and assessment skills. Lessons learned from previous wars illustrate a lack of clinical experience in many of the young nurses who were ill-prepared for the volume and severity of casualties. Clinical training in preparation for wars and disasters needs to include the basics of trauma, burns, and lifesaving procedures; decontamination; treatment; and care provided to casualties of nuclear, biological, and chemical weapons. Nurses need to learn military triage categories and management of large numbers of casualties. Clinical training prior to the event of war or disaster should simulate patient care situations that demand specialized skills and practice with available field hospital equipment. In the combat/disaster environment, diagnostic equipment is limited and nurses need to rely on their finely honed clinical assessment skills. In other words, nurses deployed for disaster and wartime response must have skills that are independent of technology. In emergency, disaster, and/or mass casualty situations, stress is intense, demands are great, and clinical responses must be almost automatic, but of high quality. Cross-training in more than one clinical nursing area is also deemed important for the overlapping use of staff and for replacements in the event of loss of staff members.

Collective training, the third tier of training, deals with hospital unit level work and preparation for functioning, as a well choreographed team. Reineck's readiness components of operational competency, leadership and administrative skills, and group integration and identification focus on knowledge of the unit mission and an understanding of basic principles behind military operations (1999). The unit's mission significantly influences requirements for deployment and response. Policies and procedures for support, protection, and defense need to be acknowledged in coordination with other hospital and combat units in a theater of operations. The mission may involve peacekeeping, peacemaking, nation building, direct combat, or disaster response, and nurses need to understand the mission in order to understand the types of casualties sent to their hospitals. For military nurses, the deployment frequency and intensity has increased and they could find themselves involved a number of deployments with varying missions throughout the extent of their military careers.

Military nurses in a wartime theater or in response to a disaster also care for members of the indigenous population and need to have cultural awareness about the country's citizens (Yoder & Brunken, 2003). The cultural beliefs, values, traditions, and history of the "occupied" country are provided readily through civil affairs training to military personnel entering the country.

Operational competency focuses on recognition of the chain of command and authority plus acknowledgement of various team member roles and activities. This knowledge clarifies unit functioning as a whole. Building and moving a

field hospital also requires the intricate training and challenging use of equipment found in deployable medical systems (DEPMEDS).

Leadership and administrative support is geared toward integrating the unit and encouraging group identification and esprit de corps. Relationship building, trust, communication, and cohesion are the goals of this unit level training. Leaders learn skills associated with all of the above readiness components and activities plus concern for the safety and comfort of unit members. Leaders have responsibility and accountability for general unit goal achievement, and focus a significant amount of time and energy on maintaining internal communications for informing unit members at all times about the current situation and changes to the mission. Plans for leadership succession with training and mentoring of future leaders are necessary in the event that replacements are needed.

Disaster Phase 2: Response/Implementation

The second phase of disaster involves the actual strike or impact whether it is due to a hurricane, blizzard, tornado, terrorist attack, mass casualty situation in wartime, or nuclear, chemical, or biological contamination. The quality of disaster response is the focus during this phase. Disaster plans are activated and rescue forces mobilized. Triage and emergency care of patients become the primary responsibility of medical and health care providers. Safe shelter, food, and water are provided to those who experience the loss of their homes. Reestablishment of communication and transportation routes, sanitation and waste removal, and protection against further serious injuries and diseases become essential.

Military nurses are well-versed in establishing their field hospitals with appropriate patient flow from helicopter and ground ambulance receiving, through triage, to the emergency treatment area, pre-operative area, operating room, recovery area, intensive care, intermediate care, and minimal care. Attention should be devoted as well to a patient decontamination area for nuclear, biological, and chemical casualties, and several of the wards should be designated for isolation of infectious disease patients.

Patients sorted by triage need to be designated according to the triage categories and all patient care staff need to comprehend the physical arrangement of their positioning. Immediate patient evacuees who will be moved to more definitive care should also be marked appropriately, maintained, and monitored for ease of evacuation when transportation means become available.

Communications are typically established through the use of field phones and individual radios; however, communication equipment is subject to frequent failures. Back up measures need to be established and the most effective technique continues to be the designated "runners" to take messages back and forth among the hospital's treatment areas, wards, and to the hospital command post. The importance of verifying all communications and reports cannot be emphasized enough. Rumors spread like wildfire during the intense stress of the emergency and hospital leaders must respond to facts only.

The hospital command post (CP) personnel communicate with all sources external to the hospital. Patient receiving, patient evacuation, hospital census, and bed vacancy reports are issued through the CP. Communication with the media also needs to be established in a central location; and one of the hospital officers may be assigned an additional, temporary role as public affairs officer to handle the media.

Security guards, if enough personnel are available, should also be positioned at all entrances and exits in order to keep unauthorized personnel from entering treatment areas. Many stretcher bearers may be called to triage as the number of casualties increase. Every staff member should know his or her role prior to the disaster Phase 2 impact so that there are no questions or confusion during implementation of the disaster plan.

The hospital should be prepared to function with minimal external support. Reaction teams made up of designated unit members may be needed in the event that the hospital comes under enemy attack. More likely is the need for basic

traffic and crowd control as well as security.

Nurses need to be trained and utilized in accordance with their acknowledged clinical skills whether the skills are in the areas of administration/management, critical care, trauma and burn care, surgery, or recovery. Equipment used during routine and daily nursing care, such as intracranial monitors, central venous and arterial lines, and intravenous pumps are unavailable in the field and nurses need to fall back on their basic assessment skills.

Disaster Phase 3: Recovery/Reconstruction/Evaluation

The third phase is post-disaster, or post-impact. This phase is more long-term. There is concern for recovery of the community and its citizens, and recovery of staff who responded as caregivers and rescue workers. During the third phase, the long-term, long-lasting effects of the disaster become a reality and people experiencing the disaster must now face lifelong losses and lifestyle changes that are permanent features in their lives.

In wartime, the military may or may not have as large a role related to community response. However, military hospitals frequently provide some level of shelter and provision of care to the indigenous population. Stabilization of wounded local citizens and their evacuation to community hospitals often occurs from military field hospitals.

The major tasks of military hospitals during Phase 3 wartime scenarios are recovery, reconstruction, and evaluation of the disaster response. Restocking of supplies, cleaning and repair of the hospital facility and equipment, and general preparation for the next influx of mass casualties occupies the staff during this last disaster phase.

Most significant during Phase 3 is the evaluation, after-action reports, and debriefings. Critical incident-related stress debriefings are established immediately in an effort to relieve the tension and provide a healthy outlet for emotional expression from the staff. Procedures and activities that were successful, as well as those that failed, are examined and new plans developed. Heroism and good deeds are recognized and rewarded openly while corrective actions are handled quietly and firmly with the involved staff.

Future Recommendations

Examination and implementation of a military disaster nursing model is necessary for its full evaluation. Research is needed to test the model and analyze various aspects of readiness components, the three-tiered program for readiness training, as well as activities and tasks within each of the three disaster phases. Research related to the military nurse's role during all phases of disaster is critical to the efficient and effective planning, response, and recovery surrounding military disaster and mass casualty situations (Hinton Walker et al. 2005; 2003).

The Department of Defense TriService Nursing Research Program (TSNRP) offers professional guidance and monetary funding for research unique to military nursing. Since its establishment in 1992, over 200 studies have been funded to provide evidence-based support for excellence in nursing practice. Research priorities include examining and improving the physical and psychological readiness of military personnel to function during times of war and disasters; developing and sustaining nursing skills, competencies, and high standards of nursing practice during war, humanitarian, and peacetime efforts; and, improvement and evaluation of patient outcomes that result from nursing care. Research to test a military disaster nursing model is significant to military nursing and encompasses all three research priorities for potential support and funding.

In order to test the model as a whole or in phases, research proposals should be developed and sent to the TSNRP for potential funding support. Implementation of experimental, pilot training programs is recommended at military hospital unit levels for evaluating Phase I of the model, Pre-Disaster Preparedness/Readiness. Training would focus on preparation for disaster nursing to include content about emotional expectations; soldier skills and clinical skills for disaster; standard trauma, triage, and evacuation procedures with evaluation of training measured through use of the READI instrument (Reineck, 1999; Reinick et al., 2001).

Phase II model evaluation regarding Disaster Impact and Response is carried out by designing and implementing disaster/mass casualty response plans and standard operating procedures. These plans are then tested at military unit pilot locations or through the Army Medical Department Center and School located at Fort Sam Houston, San Antonio, Texas. Prospective simulation training and evaluative research are conducted for determining the strengths, weaknesses, and gaps in training and planning for disasters.

The model's Post-Disaster/Post-Impact and Recovery/Reconstruction Phase III presents a greater challenge to the conduct of nursing research. Hinton Walker et al. (2005) identify the legal, ethical, and scientific difficulties associated with disaster nursing research: the need for rapid development of a proposal, obtaining timely approval from funding agencies and institutional review boards, procuring a sample of subjects who are highly vulnerable, and collecting data often in austere, dangerous, and emotionally charged environments. The authors state that nurse researchers "must plan proactively to seize opportunities for conducting research at all stages of disaster preparedness, response, and recovery" (Hinton Walker et al., 2005, p. 551). Prospective research planning with the staff and advisory council of the TSNRP may be examined as a source for testing the military disaster nursing model. Mechanisms should be developed to support ongoing approval and immediate activation of research that tests the model during actual disasters.

Conclusion

While military nurses have responded to the manmade disasters of wars for generations, actual models of military disaster nursing and their subsequent evaluations through research were not found in the current literature. Several qualitative studies addressed lessons learned by military nurse veterans of previous wars who worked in treatment settings on the land, in the air, and on shipboard. These lessons, as well as initial work conducted to examine components of deployment readiness, were incorporated into a proposed model for military disaster nursing that requires ongoing research and evaluation. Disasters of the future will be broad in scope and intense in terms of mass casualties. Additional research is needed to determine the model's usefulness in both military and civilian care environments.

A disaster occurring in one part of the world is no longer an isolated event.

Nurses need to be present at the disaster preparedness planning tables examining and creating policies and procedures for disaster response.

...a military model of disaster nursing can be applicable to both military and civilian disaster preparedness and response.

Nurses worked long hours and endured the discomforts and lack of resources found in very bleak working and living conditions.

Military triage is founded on the principle of providing the greatest amount of good for the greatest number of people within the confines of limited resources.

Emotional preparation is an integral part of individual readiness.

Nurses need to be trained in the use of weapons...for defense of self and patients.

The importance of verifying all communications and reports cannot be emphasized enough. Rumors spread like wildfire during the intense stress of the emergency...

Disasters of the future will be broad in scope and intense in terms of mass casualties.

Sidebar: U.S. Military Conflicts

Spanish American War (1898)

World War I (1914-1917)

World War II (1941-1945)

Korean War (1950-1953)

Vietnam War (1964-1975)

Desert Shield/Desert Storm (1990-1991)

Somalia (1993)

War on Terrorism (2001)

Iraqi Freedom (2002-currently)

(Mandy, 2005; Ruble et al., 2005)

Figure. Military disaster nursing model: Priority actions according to disaster phase

Legend for Chart:

A - Phase 1: Pre-Disaster/Pre-Impact Preparedness/Readiness

B - Phase 2: Disaster/Impact Response/Implementation

C - Phase 3: Post-Disaster/Post-Impact Recovery/Reconstruction/
Evaluation

A: Three-tiered preparedness/readiness training:

1. Individual readiness training

- Physical fitness training
- Emotional expectations and familiarization with disaster response

- Soldier skills training

- Family support and preparedness

B: 1. Institute communications (field phones, individual portable radios, assign runners)

C: 1. Care provided to indigenous population until evacuation to community hospitals in-country

A: 2. Clinical skills training

- Trauma training, triage, evacuation

- Procedures

- Clinical assessment; use of equipment

B: 2. Establish casualty receiving area/triage

C: 2. Recovery and restocking of supplies

A: 3. Unit/collective training

- Operational competency

- Mission knowledge

- Leadership and administration skills

- Unit integration and identification

Development of disaster/mass casualty response plans outlining activities found in Phase 2 and preparation for their eventual

- implementation; plans updated and practiced regularly.
- B: 3. Assign stretcher bearers
- C: 4. Reconstruction and repair of facility and equipment
- A: --
- B: Design and communicate patient movement and flow throughout facility
- C: 4. Evaluation and redevelopment of disaster/mass casualty plan
- A: --
- B: Establish triage sorting areas and sort casualties into specific, geographical areas throughout facility according to triage category and evacuation priority
- C: 5. Critical incident staff debriefings
- A: --
- B: Post security guards at every entrance and exit to keep unauthorized personnel from entering facility
- C: 6. Recognition and reward of positive staff response
- A: --
- B: Enactment of assigned staff roles
- C: 7. Corrective action taken for negative response
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