The Program for Research in Military Nursing: Progress and Future Direction

Committee on Military Nursing Research, Institute of Medicine

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INSTITUTE OF MEDICINE

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Preface

High-quality nursing care is essential to obtain favorable patient outcomes. Military nursing research has the capacity to prevent health problems, improve patient care, and contribute to appropriate and desirable outcomes that are cost-effective in many situations. In the last 45 years, considerable progress has been made in wide-ranging applications of research in military nursing. Unarguably, however, further evolution and programs of military nursing research will depend on enhanced scholarly inquiry by military nurses and on the dissemination and application of research results.

This report concerns the purpose and need for military nursing research and for the congressionally funded program that supports such research. In September 1995, the advisory group for the TriService Nursing Research Program asked the Institute of Medicine to establish a committee of experts to review its military nursing research program and make recommendations for management, funding, allocation of resources, and identification of program goals. A 20-member multidisciplinary group that excluded active-duty military personnel was organized, representing a range of knowledge and views regarding the practice of nursing, nursing research, and the place of nursing research in the military. Some initial unifying characteristics of the group included its knowledge of the scientific process and of scientific and programmatic review.

In less than 5 years, the TriService Nursing Research Program has grown in maturity and sophistication and has played a significant role in producing capable researchers. The program's advisory group members are aware, however, of the need to strengthen the program and create a mechanism to ensure the development of a cadre of military nurse researchers.

As the Institute of Medicine committee proceeded with its work, it became clear that there is a compelling need for research in a variety of areas that are

exclusive to the military and that these studies are best carried out by military nursing personnel. In particular, military nursing research focuses on health maintenance of military personnel and their beneficiaries, advancing the practice of military nursing in support of mission readiness and deployment, and enhancing delivery systems to improve clinical outcomes.

The committee met with both active-duty and reserve personnel from the three military Nurse Corps (U.S. Army, Air Force, and Navy), who described their research and the resources available to implement, complete, and evaluate their work. We found a group of professional men and women, committed to the advancement of military nursing, who assumed responsibility for studying problems encountered in their practice over and above their regular and demanding job assignments. The steps that the committee took to educate itself about the unique aspects of military nursing research broadened members' views and made it clear that the Army, Air Force, and Navy Nurse Corps are in need of continued support through the TriService Nursing Research Program, especially in the form of ongoing financial backing and mentoring to continue important and necessary research activities.

The chair, cochair, and the committee extend appreciation for the staff and support provided by the Institute of Medicine. In particular, we would like to thank Kenneth I. Shine, Institute of Medicine president; Karen Hein, executive officer; and Allison A. Yates, division director, who were instrumental in initiating the study. We especially appreciate the diligent work of Carol W. Suitor, study director, and the assistance of Mary I. Poos and George Davatelis, program officers. We are also appreciative of the work of research associates Yvette J. Benjamin and Sheila Moats, and project assistant Diane R. Johnson.

The experience of convening with the committee has been rewarding and inspiring for all involved. Despite our diverse backgrounds, at the conclusion of deliberations, we are all left with an appreciation and understanding of the need for a rigorous military nursing research program. The committee felt strongly that this report should be instructive to the TriService Nursing Research Group so that recommendations could be implemented easily in a timely fashion. Despite many substantial obstacles that have confronted the TriService Nursing Research Program, we were all impressed with the Corps Chief's and Director's vision for military nursing and the fact that scientific advancement has progressed steadily. It is the sentiment of the committee that with continued funding and commitment to support research and research positions, the possibilities for productivity among military nurse researchers are promising and constitute a worthy investment of the military's time and resources.

RUTH McCORKLE, *CHAIR*

GERALDENE FELTON, *COCHAIR*

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Military nursing research focuses on enhancing health care delivery systems and processes to improve clinical outcomes, advancing the practice of military nursing in support of mission readiness and deployment, and contributing to the health status and quality of life of military personnel and their beneficiaries.

Military nurses (all nurses in the Army, Air Force, and Navy, regardless of whether they are in the active, reserve, or guard component) confront a range of health problems in ambulatory clinics, community hospitals, medical centers, hospital ships, field hospitals, ships, aircraft, and other sites. Patients vary in age from the neonate to the elderly and encompass those mortally wounded in combat and those who are chronically ill. The military nurse must have knowledge and skills that are transferable to a variety of challenging peacetime and wartime scenarios. The Army, Navy, and Air Force Nurse Corps all agree that the knowledge and skill sets of nurse officers must be research based.

In fiscal year (FY) 1992, Congress appropriated initial funding of $1 million to establish the TriService Nursing Research Program to support targeted research by military nurses. This program has continued to garner yearly support from Congress and was provided with $5 million in FY 1995 and again in FY 1996. Acting through the program administrator, the program's advisory group (the TriService Nursing Research Group) asked the Institute of Medicine (IOM) to make recommendations for program management, areas for future research funding, and allocation of resources to program functions and to identify both short- and long-term objectives. To undertake the stated task, the Institute of Medicine appointed a multidisciplinary committee consisting of 20 individuals, including experts with a background in military nursing.

The committee had access to a broad array of information concerning the TriService Nursing Research Program and its portfolio. It also benefited from discussions with program staff and advisors; the chief and directors of the Army, Navy, and Air Force Nurse Corps; and a number of grantees and unfunded applicants. Extensive searches of published literature and of federally funded research in progress provided the committee with citations and abstracts for the body of research that is specific to military nursing as well as for other current major nursing research efforts. The committee used these information sources and called upon its collective expertise to assess the TriService Nursing Research Program and develop its recommendations. The committee's methods, findings, conclusions, and recommendations are described in much greater detail in the body of the report.

FINDINGS

Resources for Military Nursing Research

Each of the military Nurse Corps has official statements concerning the integral role of research to military nursing practice, and each corps has programs in place to support graduate education of selected active-duty nurse officers. The total number of doctorally prepared nurse officers is relatively small: 56 on active duty and approximately 200 members of the reserve component, which includes the guard. In contrast, the number with master's degrees is relatively large—approximately 3,600 counting only those on active duty. Nurse officers with master's degrees have received a majority of the TriService Nursing Research Program grants. The Army Nurse Corps has medical facilities that incorporate a strong focus on nursing research, and the Air Force and Navy are taking steps to increase their research capabilities.

Previous Military Nursing Research

Although historically military nurses were highly instrumental in establishing nursing research in general, the body of identifiable military nursing research articles published in peer-reviewed journals is relatively small, and the range of topics covered is large. The majority of the military nursing research literature is contained in theses, dissertations, and studies from training programs and is available only through the National Technical Information Service or the Defense Technical Information Service. Among studies funded by the TriService Nursing Research Program, the most common broad area of research is the delivery of military health care; the second is women's health; and the third is nursing care interventions under field conditions. To date,

according to program records, only one study funded by the TriService Nursing Research Program appears to have been published in a peer-reviewed journal.

TriService Nursing Research Program Operation

Over its 4-year history, the TriService Nursing Research Program has developed a $9.68 million portfolio of 77 projects conducted by nurses in the armed forces. Awards have been granted to members of all three military services, including active, reserve, and guard components. The program has instituted yearly improvements in its Requests for Proposals and scientific peer review process; implemented grants-writing workshops to assist military nurses to develop sound proposals; produced monographs that summarize completed projects; and recently subcontracted services to support peer review of proposals, program management, and grants-writing workshops. The subcontracted services should result in improved timeliness, monitoring, and dissemination of information. In 1996, in a marked departure from its first years of operation, the program made an early announcement of the probable availability of funds and will allow the funding to support grants for either a 2- or a 3-year period.

RESEARCH PREMISES

In the course of its deliberations, the committee agreed that the following premises concerning research would lay a foundation for its conclusions and recommendations:

- The quality of research is best enhanced by a rigorous system of peer review.
- The peer review of scientific merit must remain separate from policy decisions related to program management.
- In general, progress in science is best served by investigator-initiated research.
- Research requires extensive and increasingly demanding preparation to meet rigorous standards for the production and integration of knowledge.
- Research, education, and practice go hand in hand.
- Strongly focused programs of research are increasingly essential to meet strategic needs for knowledge production and utilization in response to the health needs of military beneficiaries.
- Programs of research are successful when they build on strengths.
- The development of programs of research requires a critical mass of individuals with the appropriate credentials to be scientists.

- Because of the nature of the questions that must be answered in nursing research, multidisciplinary research teams with varied skills and perspectives are essential.
- Research programs benefit from a stable infrastructure for the setting and reviewing of priorities, administration of grants, development of information systems, consultation, and other services and activities.

CONCLUSIONS

Depth and Breadth of Military Nursing Research

The Committee on Military Nursing Research concluded that the researchable problems that should be addressed by the TriService Nursing Research Program are large in number and potentially of great importance. Presently, the number of military nurse scientists available to address these questions and the infrastructure to support a robust and productive research program are quite small, especially among the active-duty component. Until recently, however, the funding available for military nursing research was extremely limited. Because of these limitations, the body of peer-reviewed research literature focused on military nursing is also small and needs to be expanded.

In order to develop the critical mass and infrastructure necessary to establish military nursing research as a viable component of the Department of Defense's (DOD's) Health Care Program, the committee concluded that there is a need to

- establish the value of military nursing research and the essential nature of its relationship to military nursing practice,
- build the infrastructure and resources needed to facilitate military nursing research, and
- generate the body of knowledge required to help guide military nursing practice.

The creation of a research culture will facilitate a program of knowledge generation required to improve standards of military nursing practice and to improve the health of service members and their beneficiaries. It will contribute to understanding the uniqueness of nursing services in circumstances of war, peacetime operations, mission readiness, and deployment.

Role of the TriService Nursing Research Program

The TriService Nursing Research Program is central to the mission of military nursing because research is essential to generate the scientific knowledge upon

which nurses base their practice. The delivery of modern health care to service members and beneficiaries requires nothing less. Hence, the TriService Nursing Research Program has begun to establish a program of research that is directly relevant to military health, that fosters collaborative relationships with other scientists and disciplines, and that creates a mentorship system for the development of junior investigators. The committee recognizes that the TriService Nursing Research Program has been operating under circumstances that are far from ideal—namely, uncertain funding from year to year and serious delays in receipt of funds. Nonetheless, the committee concludes that the TriService Nursing Research Group, which oversees the program, serves as a useful mechanism; and it commends both the TriService Nursing Research Group and the TriService Nursing Research Program administrator for their accomplishments and continuing efforts to strengthen the program.

Peer Review

Although the peer review process used by the TriService Nursing Research Program is intended to ensure the scientific merit of funded proposals, currently there is a fundamental problem in the peer review process: research proposals submitted by military nurses are reviewed exclusively by military personnel. This practice limits the pool of qualified reviewers and restricts scientific scrutiny.

MAJOR RECOMMENDATIONS

The Committee on Military Nursing Research, recognizing the great need for a strong program of military nursing research and the infrastructure required for such a program, has developed the following recommendations.

- **The TriService Nursing Research Program should be continued into the foreseeable future.** The program is relatively young and the knowledge base is evolving. This program represents a modest investment—one whose potential benefits are judged to exceed the costs—an investment regarded as necessary in all other sectors of health care.
- **The TriService Nursing Research Program should have a stable funding base to develop and sustain research programs that will have demonstrable impact on health care and the health status of military populations.** A dependable source of funds allows efficient program management and planning for the most effective use of resources and individuals' time.
- **The TriService Nursing Research Program needs to be institutionalized in an operational sense.** To accomplish this, the TriService Nursing Research Program needs to become a permanent component of the

DOD Health Care Program, and adequate funds to support the program should be incorporated into the DOD Health Care Program Objective Memorandum (POM). This change would eliminate dependence on yearly congressional appropriations, as has been the case in the past, and facilitate forward planning and efficient operation. Consistent with the language in the fiscal year (FY) 1996 Department of Defense Authorization Act, the Uniformed Services University for the Health Sciences appears to this committee to be an appropriate element within DOD to be designated to administer the program, with oversight by the TriService Nursing Research Group.

OTHER RECOMMENDATIONS

Responding to the charge to the Institute of Medicine, the committee developed additional recommendations covering four key aspects of the program: (1) program management, (2) areas for future research funding, (3) allocation of resources to program functions, and (4) identification of short- and long-term objectives. Many of its recommendations are highlighted below. Additional recommendations and explanatory information appear in the complete report.

Recommendations for Program Management

Management Structure

The committee deliberated on the existing management structure of the TriService Nursing Research Program and recommends the following:

- **The TriService Nursing Research Group should continue to provide oversight to the program.** The TriService Nursing Research Group (TSNR Group) founded the program and serves as a useful mechanism for ensuring appropriate attention to the needs of all three military services and components.
- **A doctorally prepared military nurse researcher should be employed as director of the TriService Nursing Research Program.** Strategic direction of the program requires the expertise and the dedication of a full-time, doctorally prepared nurse researcher. Ideally, the director would continue conducting research on a part-time basis, thus serving as a role model for military nurse researchers.
- **The TriService Nursing Research Program administration should develop mechanisms to facilitate programs of research rather than simply the completion of individual and possibly isolated projects.** Most advances in knowledge result from the cumulative results of sustained research programs.

Programmatic research is accomplished by the continuing efforts of an investigator or research team or by complementary studies by several investigators in a focused area of research.

- **The TriService Nursing Research Program administration should develop and implement a plan for ongoing monitoring and evaluation of the program.** Well-conceived and implemented evaluation is integral to the success of any program.
- In addition, the committee strongly urges the TriService Nursing Research Group to monitor and report on the progress and outcomes of the program within 3 years and at established intervals, as documented by systematic criteria that include evidence of peer-reviewed research publications and applications to practice.

Peer Review

Two major changes would help the program to achieve significant improvements in its scientific review process:

- **Appoint a Scientific Review Panel chair who has experience in outside grant reviews and who shows evidence of being a seasoned leader in bringing about consensus and decision making in groups.** A chair who has served on outside scientific review panels would help to ensure fair and rigorous review, including the solicitation of critiques by outside experts for topic areas not adequately represented on the panel.
- **Include at least three nonmilitary scientists with experience on outside scientific review panels on the TriService Nursing Research Program Scientific Review Panel.** This action would expand the pool of potential reviewers and make it possible for military panel members to benefit from exposure to scientists with experience on civilian research review panels.

Recommendations for Areas of Research

The research agenda for the TriService Nursing Research Program was initially established by legislation and included broad areas of research. The committee agreed that the program's areas of research should complement those currently receiving priority attention from the National Institute of Nursing Research and the Department of Veterans Affairs. Each of the program's areas of research should give attention to contexts of care that are peculiar to or highly prevalent in the military. The committee recommends that future research be focused primarily in four broad areas, as listed below. In addition, the committee

recommends that the TriService Nursing Research Group hold research priority-setting conferences on a regular basis, such as biennially.

- **Current and emerging issues or problems with clear and direct application to military nursing care during wartime and operations other than war:** The focus here is on improvement of the results of nursing services under circumstances that are relatively unique to the military. Consideration should be given to the development of research capabilities for circumstances of deployment since military deployments often occur suddenly and evolve into circumstances that present both challenges to nursing practice and opportunities for gains in knowledge not often available in civilian settings.
- **Current and emerging issues or problems related to the diverse needs of service members and their beneficiaries during peacetime, with consideration of the contextually different aspects of care in the military:** The focus should be on supporting or validating nursing science to enhance the practice of nursing that will improve patient care outcomes and/or result in efficient resource utilization.
- **Cultural aspects of military nursing:** Military nursing affords rich opportunities to examine the cultural implications and dimensions of the provision of nursing care. The committee urges investigators to formulate research questions that address nursing care problems and opportunities related to this extensive exposure to cultural differences.
- **Evaluation of research utilization and clinical relevance:** Studies in this area incorporate a process by which research results can be reviewed, evaluated, and implemented into the delivery of nursing care, with evaluation of the practice implementation. The overall goal is to facilitate state-of-the-science standards of care.

Recommendations for Allocation of Funds

The committee recommends that approximately 10 percent of appropriated funds be used to cover administrative costs, which are to include the costs of workshops and travel support in addition to funds needed for essential program operation. The remainder of funds should be used for the various grant awards, as described below. Workshops in scientific writing are an urgent need.

Recommendations for Programmatic Investment Strategies

The committee recommends expanding the current grant award categories and using more stringent requirements for grant applicants, as indicated below. It provides recommendations for award categories for the short term and for

incorporating a long-term strategy to augment current award categories as funds and other resources allow. The committee encourages flexibility for the awarding group in terms of the distribution of awards among the various categories.

Short-Term Goals for Grant Award Categories

The committee recommends *continuing* the current grant award categories —Experienced Investigator Award and New Investigator Award—with the specifications given below.

Experienced Investigator Awards. Experienced investigators are licensed registered nurses who fulfill one of the following criteria: (1) military nurses with a doctoral degree or (2) military nurses with a master's degree who have a co-principal investigator with a doctoral degree. The co-principal investigator may or may not be in the military and may have his or her doctoral degree in nursing or another discipline. To qualify as an experienced investigator, the applicant should have capability in investigation as demonstrated by completed research, publication of peer-reviewed research papers, and presentations at national or international professional meetings.

New Investigator Awards. New investigators are defined as licensed registered nurses who fulfill one of the following criteria: (1) military nurses with a doctoral degree; (2) military nurses with a master's degree who have a co-principal investigator with a doctoral degree; or (3) military nurses in a doctoral degree program who request funding for a dissertation proposal. The co-principal investigator may or may not be in the military and may have the doctoral degree in nursing or another discipline.

The committee recommends *adding* the following award categories to the short-term goals of the program.

Senior Investigator Awards. Doctorally prepared nurses who served in the active or reserve component of the Army, Navy, or Air Force Nurse Corps within the past 3 years are eligible to apply. The applicant must show evidence of an established program of research with multiple articles published in the peer-reviewed literature; must include a co-principal investigator who is currently an active, reserve, or guard nurse in the Army, Navy, or Air Force; and must provide evidence of current institutional resources to carry out the proposed research.

Utilization and Evaluation of Research-into-Practice Awards. Active, reserve, and guard nurses in all services who fulfill one of the following criteria are eligible: (1) nurses with a doctoral degree or (2) nurses with a master's degree who have a co-principal investigator with a doctoral degree.

Long-Term Goals for Award Categories

The committee recommends the *addition* of the following award categories as long-term goals, to the extent feasible.

Infrastructure Enhancement Awards. Research in military nursing may be facilitated by increased access to institutional resources. Examples of such resources include

- systems of instrumentation including computers;
- development of registries of patient outcomes during different modes of air evacuation;
- development of registries on DOD beneficiaries before, during, and after deployment; and
- software development for telemedicine and other information systems pertinent to military nursing.

Mentored Research Investigator Awards. The post-doctoral mentorship concept gives talented investigators adequate mentorship in research and offers one of the best opportunities to accelerate the pace of advance of empirically based nursing care for service members and their beneficiaries.

Centers of Excellence in Military Nursing Research. The development of Centers of Excellence in Military Nursing Research as part of the organizational structure of military medical centers or treatment facilities would enhance the career development of military nurse researchers and increase the probability of successful completion of grants awarded by this program to active-duty military nurses.

With the implementation of these recommendations and others contained in the complete report, the TriService Nursing Research Program has the potential to evolve into a strong force for the advancement of military nursing practice.

1

Introduction and Background

In 1992, Congress authorized funds to support targeted research by military nurses through a new program—the TriService Nursing Research Program (TSNR Program, S.R. 102-154). In 1995, the program's advisory group (the TriService Nursing Research Group, TSNR Group), acting through the program administrator, asked the Institute of Medicine (IOM) to convene an expert committee to review the TSNR Program and supporting literature; to make recommendations for program management, areas for future research funding, and allocation of resources to program functions; and to identify short- and long-term objectives. In requesting this Institute of Medicine study, the TSNR Group seeks more formal mechanisms for assessing the state of the science that undergirds military nursing, for sustaining the research effort necessary to improve that science, and for actively translating these results into military nursing practice.

This military nursing initiative fosters acceptance of responsibility for rapid translation of fundamental research findings into clinical applications and for directing a reasonable portion of Department of Defense (DOD) investment toward military and peace operations; humanitarian assistance; and the urgent problems stemming from preventable illnesses, violence, and substance abuse.

OVERVIEW

Scope of Military Nursing

Nurses have a major responsibility for the provision of health care. In DOD, the responsibility is enormous. Military nurses confront a daunting range of

health problems in ambulatory clinics, community hospitals, medical centers, hospital ships, field hospitals, ships, aircraft, and other settings. They are part of a health care system that incurs annually more than $15.4 billion in expenses to provide care for approximately 1.5 million active-duty military personnel and 5 million retired military personnel, family members, and other eligible beneficiaries.[1] Service members and their beneficiaries are a diverse group culturally and ethnically. For example, 22 percent of all enlisted active-duty service members are black, 7 percent are Hispanic, and 5 percent are from other racial-ethnic groups. Thirty-one percent of all active-duty forces are nonwhite (Defense Manpower Data Center, 1995).

Military nurses are responsible for controlling costs while providing state-of-the-art care ranging from the treatment of combat casualties to chronic illness and from health promotion and preventive care to maternity and gerontologic nursing for the vast range of beneficiaries. A majority of active-duty service members are young: 13 percent are age 20 years or younger, 50 percent are ages 21 to 30, and 30 percent are ages 31 to 40 (Randy T. Smith, Defense Manpower Data Center, Personal communication, 1996).

Military nurses include all nurses in the Army, Navy, and Air Force, regardless of whether they are in the active or reserve component.[2] Members of the selected reserve and guard components generally serve 2 days each month plus an additional 14 days per year. Reserve and guard members can be called to active duty on very short notice and assigned anywhere in the world during both peacetime and wartime operations.

Army

The 4,100 active-duty Army Nurse Corps officers provide nursing care in both inpatient and outpatient arenas to approximately 524,000 active-duty service members and to beneficiaries of all ages. Over 14,000 nurses serve in the reserve component. They serve in field, evacuation, and mobile facilities, as well as in the many fixed facilities in the continental United States and abroad. During Operation Desert Shield/Desert Storm, 2,265 Army Nurse Corps officers were deployed to Southwest Asia.

In Somalia, Army nurses served in a humanitarian mission executed under hostile conditions. During this mission, Army Medical Department personnel cared for the largest single-day volume of combat casualties since the Vietnam War (Feller and Moore, 1995).

[1] Nearly 2 million additional individuals are eligible to use the DOD health care system.
[2] In the Army and Air Force, the reserve component includes the Selected Reserves and the National Guard.

Navy

The Navy Medical Department provides care for approximately 613,000 active-duty sailors and marines and for 2.6 million retirees and family members of active and retired sailors and marines. Approximately 3,200 active-duty Nurse Corps officers serve in various settings throughout the world, and nearly 2,000 nurses serve in the Selected Reserve. Navy nurses provide care to eligible beneficiaries and lead, teach, and guide those who assist them. In recent years, Navy Nurse Corps officers have served in Southwest Asia aboard hospital ships and Fleet Guantanamo Bay, Cuba, caring for Haitian and Cuban migrants under extremely austere conditions.

Air Force

Approximately 4,850 active-duty Air Force nurses make up 34 percent of officers in the Air Force Medical Service. They provide care for approximately 408,000 active-duty service members and for their beneficiaries. Over 3,300 nurses serve in the reserve component. Air Force nurses play key roles in the transport of large numbers of patients for long distances. For example, the Air Force moved 8,046 patients during Operation Desert Shield/Desert Storm and 375 patients during the United Nations' mission in Haiti. Transported patients range from the neonate to the aged and encompass those who are mortally wounded to the chronically ill. Air Force nurses also provide care at mobile aeromedical staging facilities located away from the front line, where military aircraft swoop in to load the wounded and off-load "beans and bullets" for the fighting troops.

Unique Aspects of Military Nursing

The functions and processes of military work involve force projection and mission readiness. *Force projection* is the movement of military forces from the continental United States or a theater in response to the requirements of wartime or peacetime operations. Such movements may involve the mobilization and deployment of forces, return to the United States or home theater, and subsequent demobilization.

Peace operations may take several forms (peace building, peacekeeping, or peacemaking), each of which involves health care services delivered by a team that includes nurses. Humanitarian assistance is assistance provided by DOD in the aftermath of natural or man-made disasters. Such assistance is designed to help reduce conditions that present serious threats to life, health, and property. Military support to civil authorities involves the authorized use of military logistical and human resources in disaster assistance and law enforcement.

Mission readiness is the guiding principle of the military health care delivery system. The military nurse is expected to satisfy all criteria (e.g., personal health and fitness, knowledge of mobilization assignment, required training) for readiness for mobilization. The nurse may be working in a large tertiary care facility in the United States one day and be en route to a destination halfway around the world the next. Knowledge and skills must be transferable to a variety of peacetime and wartime scenarios having unique problems that the nurse officer must confront. For example, military nurses might work in North Atlantic Treaty Organization (NATO) settings where equipment may or may not match and expectations of care may differ. As another example, two Air Force nurses and three Air Force medical technician crew members routinely handle 40 to 100 patients on one aircraft, and there is a trend toward carrying sicker patients in the aeromedical evacuation system. Thus, such problems as dehydration and hemorrhage must be managed at high altitudes under difficult working conditions.

The physical and psychosocial environment aboard ship presents numerous challenges unique to the Navy. On ships, regardless of their size, the living and working spaces are cramped; mobility, equipment, and supplies are limited; and physical and professional isolation is routine. Dietary constraints, exercise limitations, and exposure to potential hazards may vary depending on the ship. The physical movement of the ship presents unusual challenges that require special care and consideration: bolting of examination tables, beds, and bunks to the floor or ceiling; physical securing of all supplies; and special handling of liquids and breakables. Although relatively few Navy Nurse Corps officers serve at sea full-time, a large portion of the population they serve does. The shipboard environment presents many occupational hazards. Therefore, nurses must be acutely aware of safety issues. Because of the unique constraints and demands of life aboard ship, Navy nurses focus their practice on mental and physical health and wellness.

Mission readiness involves the education, supervision, and evaluation of others, especially medical support personnel. Medical technicians learn basic nursing techniques and receive other training based on the mission readiness needs of DOD. Suturing, casting, and intravenous therapy are among the skills taught. Mission readiness involves interdisciplinary coordination; it requires the ability to devise novel but safe approaches to nursing care delivery in austere conditions with potentially large groups of patients. New nurse officers may need to learn about the use of old equipment, how to cope with sand or mud, and other aspects of care not covered in the usual education of nurses. Army nurses need to be able to function in a field setting or high threat environment, which may require the wearing of protective clothing for chemical and biological threats. Air Force nurses need to prepare modular air-transportable hospitals and tented patient staging facilities for patient care, and to configure

and equip aircraft for transporting patients in the air. Navy nurses may be in camouflage uniforms in the field with marines or in a fleet hospital caring for patients in a facility constructed of tents and containers.

Deployment places heavy demands on nurses and other personnel for health screening, immunization, and other preventive measures, prior to the departure of military personnel from their home station. While deployed, military nurses have major responsibilities related to the prevention of disease and non-battle injuries —monitoring and mitigating environmental threats to themselves, and to others, and promoting occupational health. Military nurses are at the vanguard in the use of deployable technology (Craigmiles, 1995; Mun, 1995; Sheridan et al., 1995). Military nurses who are not deployed may have major changes in responsibilities that result from the deployment of others.

Military nurses contribute to the credo to "conserve the fighting strength" and aid the preparedness and mission readiness of service members. They do this in three major ways: (1) by planning and delivering health care services to return ill or injured service members to their units or to stabilize and remove them from the field of operations as soon as possible; (2) by applying preventive and therapeutic interventions and evaluating health outcomes of military personnel, their beneficiaries, and others requiring humanitarian assistance or disaster relief in the context of worldwide military operations; and (3) by addressing environmental and occupational health hazards that may be encountered by service members, their beneficiaries, and others.

Environmental challenges to the provision of health care may include any of the following:

- primitive conditions with regard to sanitation, equipment, and supplies;
- exposure to temperature and humidity extremes, and to wind;
- food and water deprivation;
- hostile conditions;
- a changing battle line, with the need for rapid movement of facilities;
- "shipboard" or "in-flight" conditions with corresponding unique problems;
- dependence on host nation support facilities;
- providing care to culturally diverse populations with different beliefs about and responses to health care; and
- lack of privacy, leisure time, and professional or social supports.

Health concerns that have been raised for active-duty service members include

- infectious diseases commonly found in the United States (Bray et al., 1992; Cross and Hyams, 1990; Stout et al., 1994);

- stress fractures and overuse injuries related to high physical fitness expectations during basic or specialized training (Friedl et al., 1992; Garcia et al., 1987; Giladi et al., 1986; Jones et al., 1993; Pester and Smith, 1992; Woodruff et al., 1994);
- spousal and child abuse (McNelis and Awalt, 1986);
- cigarette smoking (Bray et al., 1992);
- heavy use of alcohol (Bray et al., 1992); and
- risky weight management practices to meet mandated weight requirements (IOM, 1995; McNulty, 1994).

Since racial and ethnic differences in health status (DHHS, 1991; Nickens, 1995) and mortality (Sorlie et al., 1995) have been well documented, and a high proportion of service members and their beneficiaries are nonwhite, the military nurse must be prepared to plan and provide appropriate care for all. Smoak and coworkers (1994) provide an example of differences in health status that may be seen among recruits: in a sample of over 900 recruits, about 40 percent of whom were female, seropositivity rates for *Helicobacter pylori* were 44 percent for blacks, 38 percent for Hispanics, and 14 percent for whites.

The military nurse may have to be prepared to care for individuals with such relatively unique health problems as the following (IOM, 1995):

- stress associated with or caused by separation, isolation, combat, or close quarters;
- exposure to chemical weapons and other toxic chemicals;
- exposure to radiation, electromagnetic fields, or hyperbaria;
- conditions resulting from prolonged exposure to unfavorable environmental conditions (heat, cold, moisture, dryness, wind, noise);
- battle injuries;
- posttraumatic stress symptoms and disorders;
- infectious diseases not ordinarily encountered in the United States;
- heavy exposure to fuels, lubricants, exhaust, insecticides, pesticides, and dust; and
- injuries incurred during training exercises or troop movements.

Moreover, military nurses have responsibilities for maintaining patient care standards; supporting functioning of the installation or community; safety; and unit cohesion, morale, and discipline. In meeting these responsibilities, they assume practice, management, and leadership roles.

Military Nursing Research

Nursing research investigates the many factors known to affect human health for the purpose of developing clinical interventions and activities that can be carried out by nurses. Military nursing research addresses many areas: the unique military environmental settings in which care is provided; mission readiness and deployment of military personnel; and improving nursing structure (delivery systems) and processes to enhance clinical outcomes, health status, and quality of life of diverse military personnel, their beneficiaries, and populations receiving care during humanitarian, peacetime, and wartime missions. The overriding purposes of military nursing research are to expand military nurses' knowledge and to improve their capacity to provide appropriate and high-quality nursing care for the armed forces. Thus, findings from military nursing research do not benefit only the military; in many cases, they benefit the civilian sector as well.

Military nursing delivers care within social conditions established to accomplish the goals of the military—conditions that may have either positive or negative effects on the health of service members and their beneficiaries. Thus, the focus of military nursing research is to understand those conditions and learn how to prevent, modify, or minimize negative health effects and to optimize positive effects. Broadly speaking, military nursing research is concerned with patterns of illness, stress, and injury; the occupational and environmental hazards that affect the health and readiness of service members and their families; and intervention studies to learn how to improve outcomes or to deliver high-quality care in a cost-effective manner. Modest investment in military nursing research has already yielded valuable results and expanded the foundation for further study.

HISTORY OF MILITARY NURSING RESEARCH

Army

The Army Nurse Corps initiated nursing research in the military and has been a major contributor to the evolution of both military and civilian nursing research. The establishment of a Department of Nursing at Walter Reed Army Institute of Research and its Nursing Research Department in 1957 provided formal recognition and opportunities for growth of military nursing research. Maj. Harriet Werley, the first Chief Nurse of the Nursing Research Department, fostered the development of a program designed to concentrate on clinical nursing research in addition to fostering participation in the collaborative studies of other disciplines (Stevenson, 1987). Recognizing the value of expert advice to a young program and lacking appropriate resource persons within the military, Major Werley secured consultation services from R. Louise

McManus—a civilian—one of the few doctorally prepared nurses at that time (Kalisch, 1977; Sarnecky, 1993; Werley, 1962).

Among the areas on which the research program concentrated were skin care (Verhonick, 1961a–c), oral hygiene (Ginsberg, 1961; Ginsberg and Yoder, 1964), the mechanics of vomiting (McCarthy, 1964), body temperature measurements (Nichols, 1968, 1972a, b; Nichols and Glor, 1968a, b; Nichols and Kucha, 1972; Nichols and Verhonick, 1967, 1968; and others), and circadian rhythms (Felton, 1970, 1973).

Since 1968, the Army has designated the position of nursing research consultant to the Army Surgeon General to serve as the primary adviser to the chief of the Army Nurse Corps and the Army surgeon general on matters pertaining to nursing research. In 1976, the Nursing Research Advisory Board was established to advise and assist the chief of the Army Nurse Corps to establish research priorities and monitor research initiatives throughout the Army Medical Department (Kennedy, 1994).

In 1981, the Army Nurse Corps held the first Phyllis J. Verhonick Nursing Research Symposium as a mechanism to disseminate findings from nursing research and to advance the knowledge of research (Kennedy, 1994). Named after a leader in both the military and the civilian nursing communities, this conference continues to be held biennially. The 1996 conference has been opened to the Navy and Air Force.

Since the 1980s, the Army Nurse Corps has decentralized its nursing research structure and implemented a regional approach. The nursing research consultant coordinates the regional nursing research coordinators on a daily basis, with the Nursing Research Advisory Board providing periodic global oversight (see Chapter 3 for further information).

The Army Nurse Corps has long recognized the importance of education to research and, during 8 of the 9 years between 1961 and 1969, offered a 40-week course: "Military Nursing Practice and Research" (Kennedy, 1994). This course was used to train a cadre of 28 junior researchers (minimum requirement was a baccalaureate degree). Since the 1960s, the Army Nurse Corps has provided graduate education in civilian education programs for selected promising nurse researchers.

Navy

Kalisch (1977) examined the history of nursing research in the Navy, primarily by review of unpublished master's theses. The range of research topics was broad, covering various aspects of the organization and administration of nursing service, and nursing practice (from procedures for administering medication through public health nurse assessment of preschool

children). By 1977, only two nurses had been supported for doctoral study. Formal research endeavors of the Navy Nurse Corps date back to 1982, when Capt. Karen Rieder was assigned as director of the Health Services Research Department at the Naval School of Health Sciences, Bethesda, Maryland (R.Adm. J. M. Engel, Nurse Corps, U.S. Navy, personal communication, 1996). Further work to incorporate nursing research into the Navy Nurse Corps became prominent in 1987, when the Navy conducted a review of billets and identified 11 that called for a doctorally prepared nurse (see Chapter 3).

Air Force

Kalisch (1977) also traces the history of nursing research in the Air Force, primarily through the review of unpublished mimeographed documents covering research at the School of Aerospace Medicine at Brooks Air Force Base, Texas. Among the research topics reported are the development of equipment for aeromedical evacuation (such as examination lamps, oxygen and humidity apparatus, hand disinfection devices, patient-monitoring and blood pressure measurement, litter lift, and transportable airborne stations). Farrell and Allen (1973) reported physiological and psychological changes experienced by Air Force nurses associated with flying duty on jet and propeller aircraft, and Ford and Lake (1979) studied ways to evaluate patient care in flight. The first doctorates earned by Air Force nurses were awarded in 1967 and 1968 (Kalisch, 1977).

THE TRISERVICE NURSING RESEARCH PROGRAM

Doctorally prepared nurses from the Army, Navy, and Air Force began meeting informally in 1988 at the Association of Military Surgeons of the United States (AMSUS) convention. In the fall of 1990, representatives from the Army, Navy, and Air Force met to discuss collaborative research among the services. This group formed the Federal Nursing Research Interest Group; its military members later became the TriService Nursing Research Group (TSNR Group). In the spring of 1991, these representatives, along with their respective corps chief or director, met with representatives of the National Center for Nursing Research (NCNR, now the National Institute for Nursing Research) to discuss issues relevant to how the NCNR could assist the military services with developing a coordinated strategy of nursing research activities within the military milieu. The meeting concluded with informal recognition of the TSNR Group by the corps chief and directors, and the commitment of the NCNR to assist and consult with the services on matters relevant to military nursing research. The TSNR Group was made responsible for finding ways to promote

military nursing research both collectively and individually, within and across the services.

Authorization and Appropriations

The initial appropriation for the TSNR Program under S.R. 102-154 was $1 million for fiscal year (FY) 1992. Subsequent appropriations awarded $2 million for FY 1993 (P.L. 102-396, 1993), $3 million in 1994 (Department of Defense Appropriations Act, 1994, H.R. 3116), and $5 million in FY 1995 (Department of Defense Appropriations Act, 1995, 103rd Congress, H.R. 4650). In FY 1996, $5 million was again appropriated for this program, and most importantly, the FY 1996 Department of Defense Authorization Act contained specific language authorizing the TriService Nursing Research Program as part of the DOD Health Care Program, administered by the TriService Nursing Research Group and established at the Uniformed Services University of the Health Sciences (Chapter 104, title 10, U. S. Code as amended).

Relationship with Other DOD Research Programs

A $5 million appropriation for the TSNR Program represents a very modest portion of the total funds allocated for research in the DOD budget. The entire FY 1996 DOD appropriation of over $243 billion includes more than $36 billion for Research, Development, Test, and Evaluation (RDT&E), of which $305 million or more[3] is allocated for Medical RDT&E. However, the $5 million TSNR Program funds are incorporated in the $10 billion DOD health care appropriation (Public Law 104-61).

The TSNR Program dollars are intended to focus entirely on nursing research—an area not addressed by other military research programs. Major areas of research emphasis for DOD Medical RDT&E include medical defense against chemical warfare agents, medical defense against biological warfare agents, combat casualty care, infectious diseases, and military health hazards. Few, if any, doctorally prepared nurse researchers participate as investigators in the DOD Medical RDT&E programs.

[3] This does not include Medical Basic Research funds, Navy Medical Technology funds, or medical research supported by the Air Force—none of which are identified separately in budget lines.

SUMMARY

This chapter presents an overview of special areas to be considered in an analysis of military nursing research needs. It briefly examines the history of military nursing research and of the new TSNR Program, which is addressing the challenge of improving the scientific knowledge base of military nursing practice. Subsequent chapters in this report describe the methods used by the Institute of Medicine committee to accomplish its task; information about past and current research relevant to military nursing; a description of the TSNR Program and its execution, including program evaluation; and the committee's conclusions and recommendations.

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2

Methods

The Institute of Medicine study process was initiated with the formation of the Committee on Military Nursing Research—an expert multidisciplinary committee. The committee process included extensive information gathering; examination of TriService Nursing Research Program (TSNR Program) materials and materials from the chief of the Army Nurse Corps and the directors of the Navy and Air Force Nurse Corps; examination of research citations and abstracts; and discussions of various aspects of the three military Nurse Corps and the TSNR Program with representatives of each. Committee deliberations directed the acquisition of information, and recommendations are based on the collective opinion of the expert committee.

COMPOSITION OF THE COMMITTEE

In order to identify experts in all relevant fields of nursing and in related health sciences, nominations were solicited from a wide array of individuals and organizations: Institute of Medicine members and staff; members of the National Academy of Sciences; the TriService Nursing Research Group (TSNR Group); U.S. Public Health Service; American Academy of Nursing; American Nurses Association; American Association of Occupational Health Nurses; National Association of Hispanic Nurses; the National Black Nurses Association; the National Association of Pediatric Nurse Associates and Practitioners; the Association of Women's Health, Obstetric and Neonatal Nurses; the American Association of Critical Care Nursing; the Retired Army Nurse Corps Association; and the Society of Retired Air Force Nurses.

Nominations were also sought from prominent researchers in academic health centers around the country and from military service members.

The Institute of Medicine's final selection of committee members from this extensive list of nominees ensured representation of the various fields of nursing; related fields such as epidemiology, biostatistics, nutrition, physiology, and health policy; and the three branches of the armed forces. The nine committee members who have experience in the military are reserve, retired, or former members of the armed forces.

INFORMATION GATHERING

To assist the committee in its evaluation of the TSNR Program, extensive information was gathered in three areas: (1) program history and support for the program, including federal legislation; (2) program administration, implementation, and products; and (3) relevant published and current nursing research. The committee as a whole advised project staff on general parameters for information gathering, whereas each of the committee's three working groups (administrative/structure, process, and outcome) provided detailed guidance concerning types of information needed to prepare letters of inquiry, data collection forms, and questionnaires.

History and Support for the Program

The committee reviewed the legislation authorizing the program in fiscal year (FY) 1996 and the appropriations history of the program beginning with its initiation in FY 1992. The committee recognized that military nurses work in a unique environment and that frequently the success of efforts to obtain funding and carry out a coherent research program depends on balance with other commitments; therefore, it sought additional information from the three military service branches. In particular, it requested information concerning the history of military nursing research, opportunities for military nurses for advanced educational preparation, research opportunities, number of positions requiring nurses with advanced degrees, and the importance of nursing research to their overall mission. Information was requested from the chief of the Army Nurse Corps and the directors of the Navy and Air Force Nurse Corps; the chiefs of the Army, Navy, and Air Force Reserves Nurse Commands; and the chiefs of the Army and Air Force National Guard. Current members of the TSNR Group provided the committee with a description of the program and its goals, historical information, and responses to specific questions. Information on the history of the program was also sought from past members of the TSNR Group and from the published literature.

Various representatives of the military participated in open sessions at each of the three committee meetings to share information about the history and goals of the program, the place of nursing research in the military, and unique aspects of military nursing. These individuals included the present and past program administrator, members of the TSNR Group, the chief and directors of the three Nurse Corps or their representatives, and selected TSNR Program grant recipients. In addition, the committee received a briefing on unique aspects of military nursing.

Program Administration, Implementation, and Products

The administrator of the TSNR Program provided extensive access to program materials. The committee reviewed the abstracts written by principal investigators for all proposals submitted (both funded and unfunded), the Request for Proposal (RFP) announcements for each of the five program years, the guidelines for peer review panels, the specifications to grant awardees for reporting requirements, reports field by the program administrator following completion of proposal evaluations by the Scientific Review Panels, and monographs of final reports. In addition, the committee was provided access to the curricula vitae of members of the Scientific Review Panels, copies of two background books for the TSNR Program-sponsored grants-writing workshops, and an outline of administrative services to be provided for the TSNR Program by a subcontractor.

Among the materials were summaries of total applications received and applications funded for each of the four years of the program, FY 1992–1995; summaries of grants awarded by service branch plus summaries of grants awarded to senior and new investigators in 1995; and summaries of total dollars requested and total dollars awarded. This information is discussed in Chapter 4.

Project staff abstracted such information as highest educational degree of the principal investigator, requests for no-cost extensions, evidence of transfers, and availability of interim and final reports; and summaries of these data were prepared (see Chapter 4).

A total of five TSNR Program grantees, who represented each branch of the military Nurse Corps, gave presentations that addressed the competitive grant process, the value of comments received from the scientific review panel, the use of contact people, grants-writing workshops, funding strategies, support from the commanding officer, and other topics pertinent to the awarding of grants and the conduct of their research.

With detailed guidance from the committee, staff prepared two questionnaires (Appendixes A and B), slight modifications of which were used to obtain information by telephone from random samples of nine grantees and nine unfunded grant applicants. Summaries of responses to those questionnaires

are presented in Appendixes A and B and incorporated into the committee's analyses as appropriate.

Current and Published Research

With guidance from the committee, project staff conducted searches of selected on-line databases to identify research articles related to military nursing and to obtain information on the types of nursing research currently being funded. The search of the published literature was purposely limited to articles on nursing topics that are peculiar to the military or studies that were known to involve military populations. This eliminated a large body of published nursing research that is applicable to both the civilian and the military populations. More detail on the search process is provided in Chapter 3.

RESEARCH PREMISES

In the course of its deliberations, the committee agreed that the following premises concerning research would lay a foundation for its conclusions and recommendations:

- The quality of research is best enhanced by a rigorous system of peer review.
- The peer review of scientific merit must remain separate from policy decisions related to program management.
- In general, progress in science is best served by investigator-initiated research.
- Research requires extensive and increasingly demanding preparation to meet rigorous standards for the production and integration of knowledge.
- Research, education, and practice go hand in hand.
- Strongly focused programs of research are increasingly essential to meet strategic needs for knowledge production and utilization in response to the health needs of military beneficiaries.
- Programs of research are successful when they build on strengths.
- The development of programs of research requires a critical mass of individuals with the appropriate credentials to be scientists.
- Because of the nature of the questions that must be answered in nursing research, multidisciplinary research teams with varied skills and perspectives are essential.
- Research programs benefit from a stable infrastructure for the setting and reviewing of priorities, administration of grants, development of information systems, consultation, and other services and activities.

SUMMARY

The multidisciplinary Institute of Medicine committee reviewed a broad range of materials and sought historical, current, and future-oriented perspectives on military nursing, the military nursing research base, and the infrastructure of military nursing research. A set of premises about research was adopted for use during deliberations. Chapters 3 and 4 provide summaries of the data examined by the committee and the analysis that undergirds the recommendations appearing in Chapter 5.

3

Military Nursing Research

Military nursing research is defined as nursing research with direct relevance to the military environment. Its objectives are to advance the practice of military nursing in support of mission readiness and deployment; to enhance nursing delivery systems and processes to improve clinical outcomes during peacetime, wartime, and humanitarian relief missions; to improve the health status and quality of life of military personnel and their beneficiaries; and to provide optimal nursing care in settings throughout the world. The fundamental purpose of military nursing research is to further the knowledge of military nurses and to enhance their capacity to provide quality nursing care for the armed forces.

At the time of this writing, the TriService Nursing Research Program (TSNR Program) is starting its fifth year of funding research proposals *by* military nurses *for* military personnel and their beneficiaries. The program has received increasing financial support from the U.S. Congress, from a $1 million appropriation in 1992 to $5 million in 1995 and again in 1996.

NURSING RESEARCH RESOURCES IN THE MILITARY

The TSNR Program functions in an environment in which the resources for conducting military nursing research differ across the three services, but the Army, Navy, and Air Force Nurse Corps have each demonstrated their support for nursing research.

To understand the environment of military nursing research better, the Institute of Medicine committee examined official positions of the military

Nurse Corps concerning military nursing research, information about positions that call for doctorally prepared nurses, the supply of doctorally prepared nurses, the number of nurses enrolled in advanced degree programs, and major resources for facilitating nursing research in each of the military services.

Policy Statements Supporting Military Nursing Research

The following excerpts from policy statements indicate the support of the military Nurse Corps for nursing research.

Army

The Army Nurse Corps (ANC, 1981) established its policy statement on the value of nursing research to the Corps in 1981; excerpts from this statement follow:

> Nursing research is ethical, responsible and relevant to nursing practice. . . .
> The primary task of nursing research is to advance nursing practice and improve patient care. The nursing profession, and hence the Army Nurse Corps officer, has an obligation to contribute to nursing science by conducting or participating in nursing research as well as research from other disciplines.
> The professional Army nurse has a personal responsibility to deal effectively with ethical issues and to be informed about pertinent legal parameters of practitioner–research relationships to subjects with respect to human rights. There is a coexisting responsibility of the ANC in a corporate sense to uphold the ethical and legal aspects of research. . . .
> Research is the foundation of our practice discipline. To retain a credible professional posture and sustain accountability for our professional practice, the knowledge generated through research is essential. . . . The development of knowledge through research is essential for accountability of the profession to our patients and to the larger military organization.

Navy

The Navy Nurse Corps (1993) demonstrated a commitment to increased nursing research in its strategic plan, which was first published in 1993:

> Our practice of nursing will be customer-focused and research-based.

> The Navy Nurse Corps will support research as integral to nursing practice and health care delivery. We will invest in, conduct, apply, and publish research. We will validate the efficacy of nursing intervention, procedures, and techniques through research. We will use research findings to measure patient outcomes and determine the cost-effectiveness of nursing practice.
> Our nursing practice takes place within a dynamic health care system and is influenced by professional standards, mission-specific requirements, and research.

Air Force

The Air Force adopted a policy of support for nursing research within its ranks. A recent nursing operations manual (U.S. Air Force, 1994) includes the following excerpts from Air Force Instruction 46-101 in its outline of the responsibilities of a nurse executive: to

> "coordinate and apply nursing research activities, protocols, or findings within the medical treatment facility" and to "promote research throughout the facility." Clinical nurses have the opportunity to: "participate in research studies."

The Total Nurse Force Strategic Plan (Col. Nina Rhoton, USAF, NC, Professional Nursing Programs, Office of the Surgeon General, personal communication, 1996) includes a goal of fostering and supporting nursing research.

Positions Calling for Doctorally Prepared Nurses

The number of approved positions for doctorally prepared nurses differs substantially among the three services, as indicated below.

Army

Currently, the Army has 54 approved positions that call for doctorally prepared nurses to occupy roles in research, clinical practice, administration, or education; and it has 36 doctorally prepared nurses on active duty.

Navy

In 1987, the Navy Nurse Corps conducted a review of all billets (approved positions) worldwide and identified 11 billets that specify doctorally prepared

nurses. The Navy Nurse Corps currently has eight active-duty nurses with this educational preparation. Billets include clinical nurse researchers and directors of such programs as anesthesia nursing and education. Research billets are located at the National Naval Medical Center, Bethesda, Maryland; the Naval Medical Centers in Portsmouth, Virginia, and San Diego, California; and the U.S. Naval Hospital in Okinawa, Japan.

Air Force

U.S. Air Force currently has two billets requiring doctorally prepared nurses: the director of nursing research at the Graduate School of Nursing at the Uniformed Services University of the Health Sciences (Bethesda, Maryland) and the senior health service researcher at the Air Force Surgeon General's Office at Bolling Air Force Base in Washington, D.C. There is one billet, currently unfilled, as senior clinical coordinator for students in the second year of the U.S. Air Force graduate program conducted with Texas Wesleyan University in Fort Worth, Texas, and a recently approved billet for a doctorally prepared nurse in the graduate education program at Uniformed Services University of the Health Sciences. There are 12 active-duty nurse officers with the earned doctorate.

Master's and Doctorally Prepared Nurses

As summarized in Table 3-1, there are currently 3,125 master's-level and 56 doctorally prepared nurses out of approximately 12,000 active-duty nurses in the three military services combined. Thus, approximately 25 percent of active-duty military nurses have at least a master's degree, and approximately 0.5 percent have an earned doctorate. By comparison, approximately 10 percent of civilian nurses have a master's degree or greater.[1]

Although the percentage of master's-level nurses in the military is higher than that in the civilian population, both the percentage and the total number of doctorally prepared military nurses are small in relation to the many research questions confronting military nurses. As described below, not all of the active-duty doctorally prepared military nurses are involved in research. The majority (196) of the doctorally prepared military nurses are reservists (see Table 3-1).

[1] That is 173,900 out of 1,764,500 fully employed registered nurses (estimated active supply of total registered nurses and education preparation as of December 31, 1994, Division of Nursing, Bureau of Health Professions, Health Resources and Services Administration, U.S. Department of Health and Human Services).

TABLE 3-1 Total Military Nurse Corps Officers, by Component, Educational Preparation, and Service

	On Active Duty			Total Doctorally Prepared Nurse Corps Officers	
Service	Total Nurse Corps Officers[a]	Total Master's Prepared Nurse Corps Officers	Reserve Component Officers[a]	Active	Reserve[b]
Army	4,100	1,270	14,197	36	75
Navy[c]	3,309	623	1,900	8	38
Air Force	4,853	1,232	3,361	12	83
Total	12,262	3,125	16,987	56	196

[a] Statistics from the respective offices of the chief or directors of Nurse Corps or of the reserve component.
[b] Includes National Guard.
[c] Includes Marine Corps.

Errata

P. 35, Table 3-1: the total value for "Reserve Component Officers" should be *19,458* not *16,987*.

Each of the military Nurse Corps has supported advanced educational preparation of selected active-duty nurse officers. Between 1990 and 1995, the Army Nurse Corps supported doctoral education for 24 Nurse Corps officers, the Navy Nurse Corps did so for 11, and the Air Force Nurse Corps for 7. Although this support for advanced education has been relatively consistent over the period examined, the net gain in the number of doctorally prepared Nurse Corps officers is low, primarily due to retirement.

Facilities for Research

Army

The Nursing Research Service at Walter Reed Army Medical Center (Walter Reed AMC) has four approved positions for doctorally prepared active-duty nurses whose primary duty responsibilities are to manage or conduct nursing research projects and to mentor new nurse investigators. Recognized as the primary site within the Army for developing new nurse researchers, the service supports the implementation, dissemination, and utilization of research throughout the Department of Nursing.

Madigan Army Medical Center (Madigan AMC) in Tacoma, Washington, also has a Nursing Research Service, which combines military and civilian nurse research staff. This service supports the Madigan Department of Nursing in the implementation, dissemination, and utilization of nursing research.

In March 1992, the role of regional nursing research coordinator was created to decentralize the Army's nursing research structure (Kennedy, 1994). Regional sites include Walter Reed AMC; Madigan AMC; Tripler Army Medical Center in Honolulu, Hawaii; Brooke Army Medical Center in San Antonio, Texas; William Beaumont Army Medical Center in El Paso, Texas; Fitzsimmons Army Medical Center in Denver, Colorado; and Eisenhower Army Medical Center in Augusta, Georgia. The nursing research consultant integrates, facilitates, and guides the work of regional nursing research coordinators. In addition, the Nursing Research Advisory Board, which meets yearly or biennially, as needed, provides global oversight for research in Army Nurse Corps. The regional nursing research coordinators are doctorally prepared nurse officers who serve in this capacity in addition to their assigned position, which ideally has a research focus.

Navy

At present, there are no specific Navy facilities or commands designated as centers of research, nor is there one specific Navy-wide nursing research program. However, the Navy Nurse Corps expresses belief in the future of doctorally prepared nurses in the Navy Nurse Corps. As the inventory of master's and doctorally prepared nurse researchers grows, the Navy plans to assign two doctorally prepared nurses to selected tertiary care facilities, including the National Naval Medical Center, Bethesda, Maryland, and the Naval Medical Centers in San Diego, California, and Portsmouth, Virginia. These billets will provide novice Navy nurse researchers with a supportive environment and facilitate more collegial and collaborative relationships within the Navy and among the services.

Possible future assignments may include service as directors of clinical investigation departments, a headquarter's position to involve the Clinical Investigation Program throughout the Navy, assignment to various policy review and development positions within the Navy or the Department of Defense (DOD), or service as regional geographic coordinators.

Air Force

The Air Force currently has no formalized centers of research. Nursing research committees exist in various Air Force medical centers, and nurses hold membership on multidisciplinary research committees at some treatment facilities. Also, nurses participate in institutional reviews of clinical research. The Air Force is in the process of coordinating the assignment of doctorally prepared nurses to its four Clinical Investigation Divisions, which operate at the largest Air Force medical centers: Andrews Air Force Base in Washington, D.C.; Travis Air Force Base in California; Wright-Patterson Air Force Base in Ohio; and Wilford Hall in San Antonio, Texas.

PUBLISHED AND CURRENT RESEARCH RELEVANT TO MILITARY NURSING

Examination of the body of published works in a field can help to identify strengths and areas needing increased attention. Ongoing civilian nursing research is likely to have considerable application to military nursing, especially with regard to improving nursing care and nursing care systems for beneficiaries of service members. Therefore, the committee conducted extensive literature searches to identify published works on military nursing research and targeted searches to identify studies being conducted as part of major programs of

ongoing civilian nursing research. Relevant citations from these searches appear in the companion publication to this report, *Military Nursing Research: Bibliographies* (IOM, 1996), along with annotations to the extent that abstracts were available. The search results are discussed briefly below.

Published Military Nursing Research

Search Strategy

Seven databases served as the source of research citations and abstracts of the published scientific literature directly applicable to military nursing, as shown in Table 3-2. Each database served as a unique source of relevant information, with distinct and discrete emphasis for the study. For the databases MedLINE, Current Information in Nursing and Allied Health Literature (CINAHL), Health Services/Technology Assessment Research (H-STAR), PsycInfo, and National Technical Information Service (NTIS), the following search strategy was used:

> Descriptor **[nursing]** and any of the following terms, anywhere in the record:
> **[aerospace** *or* **air evacuation** *or* **air force** *or* **armed forces** *or* **army** *or* **champus** *or* **combat** *or* **deployment** *or* **depmed** *or* **desert shield** *or* **desert storm** *or* **echelons of care** *or* **field hospital** *or* **field nursing** *or* **flight** *or* **gulf war** *or* **medevac** *or* **military** *or* **military dependent** *or* **national guard** *or* **naval-medicine** *or* **navy** *or* **posttraumatic** *or* **readiness** *or* **recruit** *or* **reserves** *or* **retiree** *or* **service member** *to* **telemedicine** *or* **transport** *or* **tricare** *or* **Vietnam]**

The search strategy for the database Technical Reports (TR) in the Defense Technical Information Center (DTIC) Defense Research On-line System (DROLS) and Dissertation Abstracts used the descriptor term **[nursing]** and the free text term **[military]** only.

These strategies intentionally limited the search to articles that deal with nursing care of military populations and other nursing topics with either a military focus or a focus on a subject highly relevant to the military, such as flight nursing or telemedicine. Information retrieved in the search of published works was, in many cases, different from areas of research funded by the TSNR Program. The committee recognizes that if some of the funded studies had already resulted in publications, several might not have been uncovered by employing the specified search strategies, especially those that did not use military study populations.

TABLE 3-2 Databases Searched for Published Research Relevant to Military Nursing

Database	Years Searched
MedLINE	1966–1995
Current Information in Nursing and Allied Health Literature (CINAHL)	1983–1995
Health Services/Technology Assessment Research (H-STAR)	1975–1995
PsycInfo	1967–1995
National Technical Information Service (NTIS)	1964–1995
Technical Reports (TR) in Defense Technical Information Center (DTIC) Defense Research On-line System (DROLS)	1985–1995
Dissertation Abstracts	1977–1995

Results of Literature Searches

Having access only to citations and abstracts (and sometimes only to citations), committee members did not assess the quality of the studies retrieved in the literature searches. Neither did they explore all aspects of a specific topic as would be done if they were preparing a research proposal. Instead, they focused on the number and range of studies in an area; the approaches used in addressing the topic; the extent to which citations were likely to represent peer-reviewed research articles; and the extent to which cultural background was considered, if applicable. The bibliographies produced from the search results (IOM, 1996) include citations to some studies that committee members considered might be seriously flawed. Such citations are included because they are a part of the information processed. No indications of quality are to be assumed.

Of the more than 2,000 citations retrieved from the databases MedLINE, CINAHL, H-STAR, and PsycInfo, 161 were identified by the committee as research reports or reviews relevant to military nursing. Many of these did not address military populations. Citations and abstracts for research articles identified through search of NTIS and Technical Reports in DROLS (DTIC) were examined separately since a majority have limited distribution and have not undergone the peer review that is typical for scientific journals. From the combined retrieved citations for technical reports, 150 were identified as obvious research reports, a large percentage of which were master's theses.

The search of Dissertation Abstracts yielded 73 relevant abstracts, 51 of which were for doctoral dissertations. All of these dealt, at least in part, with military nurses or with patients who were current or retired service members or their dependents. An additional 15 dissertations addressing military topics (titles only) were uncovered in the search of CINAHL and PsycInfo. The committee

categorized the research reports retrieved from the search of journals, technical reports, and dissertations separately into 10 topic areas, as shown in Table 3-3.

It is clear that health services planning or health services and resources is the topic area that has been studied most extensively overall. This category covers many subjects, including a number of published research articles on topics related to aeromedical evacuation, technical reports on medical supply systems, and such service-specific topics as tasks of the shipboard independent duty hospital corpsman. Nurses' career development has also received much attention, with recruitment and retention of personnel major topics of concern. After military nursing history (48 titles), stress and coping is the topic with the most titles (25) obtained from the search of the databases covering professional journals, but this number includes many dissertation abstracts retrieved from PsycInfo. A number of these stress and coping articles deal with posttraumatic stress. Few articles address cultural topics related to military nursing. References to historical articles appear separately in *Military Nursing Research: Bibliographies* (IOM, 1996).

In addition to the above sources of research articles, each of the three military services has these and dissertations on file at selected repositories. For instance, there are 192 Navy Nurse Corps theses and dissertations on file at the Stitt Medical Library in Bethesda, Maryland; their titles appear in the

TABLE 3-3 Categorization of Military Nursing Research Articles Retrieved from Database Searches for Journal Articles, Technical Reports, and Dissertation Abstracts

Topic	Journal Articles (n = 161)	Technical Reports (n = 150)	Dissertation Abstracts (n = 73)
Nurses' career development	22	31	15
Military nursing history	48	6	14
Patient risk factors	1	3	15
Stress and coping	25	5	10
Health services planning or health services and resources	24	53	10
Nursing care practice/ procedures	16	22	5
Nurses' cognitive style/ learning principles	2	8	1
Patient care outcomes	6	8	2
Adverse drug effects	0	1	1
Nurse and/or patient perceptions	17	15	0

Errata

P. 40, Table 3-3: in the "Technical Reports" column, the value for "Health services planning" should be *54* (not *53*), the value for "Nursing care practice/procedures" should be *21* (not *22*), and the value for "Patient care outcomes" should be *6* (not *8*).

companion bibliography. The Air Force's Air University Library at Maxwell Air Force Base, Alabama, has approximately 100 theses covering nursing research conducted by members of the Air Force. Although the Army does not require a formal filing of dissertations, there are dissertations on file at Walter Reed AMC library. All Army theses and dissertations are abstracted at the Nursing Research Service at the Walter Reed AMC.

The committee searched specifically for articles that covered racial and ethnic background. Several of the articles on recruitment and retention did (Kocher and Thomas, 1994; Shigley, 1988; Simpson, 1992; Thomas et al., 1988, 1989). Smith (1993) addressed language and cultural barriers during Operation Desert Shield/Desert Storm. Erickson-Owens and Zdenek (1988) focused on removing cultural barriers to care during childbearing by Philipino, Korean, and Mexican-American mothers. The committee found no other articles that clearly focused both on the military and on cultural issues.

The published literature contains many nonresearch articles relating to the history of military nursing, anecdotal reports of challenging aspects of nursing care, and articles that address recruitment and job satisfaction. The retrieved titles and abstracts (and the articles themselves) may stimulate identification of potentially fruitful areas for military nursing research. To this end, selected titles are included in the companion publication to this report, *Military Nursing Research: Bibliographies* (IOM, 1996).

Current Civilian Nursing Research

To avoid making recommendations that would duplicate ongoing research, the committee examined results of searches of databases providing information on two major nursing research programs: those conducted by (1) the National Institute for Nursing Research (NINR) and (2) the Department of Veterans Affairs. Brief descriptions of these programs follow, along with brief summaries of the search results. The companion publication *Military Nursing Research: Bibliographies* (IOM, 1996) gives listings of the studies that were retrieved and annotations (where abstracts were available).

National Institute of Nursing Research

According to its mission statement, the NINR (1995) seeks to

> reduce the burden of illness and disability by understanding and easing the effects of acute and chronic illness; to improve health-related quality of life by preventing or delaying onset of disease or slowing its progression; to establish better approaches to promoting health and preventing disease; and to improve

clinical environments by testing interventions that influence patient health outcomes and reduce costs and demand for care.

Under this broad mandate, NINR launched its first National Nursing Research Agenda in 1987 by implementing seven research priorities (NINR, 1993) designed to provide a structure for selecting scientific opportunities and initiatives; these priorities were

1. low birth weight: mothers and infants;
2. HIV (human immunodeficiency virus infection): prevention and cure;
3. long-term care for older adults;
4. symptom management: pain;
5. nursing informatics: enhancing patient care;
6. health promotion for older children and adolescents; and
7. technology dependence across the life span.

In 1992, the National Nursing Research Agenda (NINR, 1993) established five more research priorities designed to guide a portion of NINR funding from 1995 through 1999:

1. community-based nursing models;
2. effectiveness of nursing interventions in HIV/AIDS;
3. cognitive impairment;
4. living with chronic illness; and
5. biobehavioral factors related to immunocompetence.

The search of the database CRISP identified 317 studies being conducted by NINR, most of which could be categorized in the areas described above. None of these has a study focus that is related specifically to military nursing, but management of pain, nursing informatics, and biobehavioral factors related to immunocompetence would have direct applicability to service members and their beneficiaries alike.

Nursing Research Initiative

The Department of Veterans Affairs began a small but similar program of nursing research in 1993 called the Nursing Research Initiative. This program is designed to "(1) encourage new research projects pertaining to nursing topics; and, (2) expand the pool of nurse investigators within the VA health care system" (U.S. Department of Veterans Affairs, 1995).

A search of the database Federal Research in Progress identified current nursing research projects funded by the Department of Veterans Affairs, including one that was not initiated. A broad scope of topics was covered, including responses to touch, various aspects of mental disorders, biological rhythms in intensive care patients, roles and competencies of nurses, and comparative studies of selected nursing techniques.

STUDIES FUNDED BY THE TRISERVICE NURSING RESEARCH PROGRAM

The committee closely examined the content of abstracts of the 77 research proposals that were funded by the TSNR Program during the fiscal year (FY) 1992 through FY 1995. References for these studies are listed in Appendix D, and the complete abstracts are given in the companion publication *Military Nursing Research: Bibliographies* (IOM, 1996). To develop an understanding of the scope and types of studies that received funding, the abstracts were analyzed in two ways: by examining (1) the distribution of grants among priority areas identified by the TSNR Program in its annual Request for Proposals and (2) characteristics of the studies. Because military populations are very diverse culturally, the committee also examined the abstracts for attention to this topic.

Distribution of TSNR Program Awards by Priority Areas

Priority areas for the TSNR Program are listed in Table 3-4 for 1992 and 1993, in Table 3-5 for 1994, and in Table 3-6 for 1995, along with the number of projects and total funding in each priority area. The committee categorized the abstracts since this information was not available from the program. Over the first 2 years of the program, with $1 million in funding during FY 1992 and $2 million in FY 1993, grants were distributed unevenly among the five priority areas, with two areas receiving no awards (Table 3-4). The major area funded was health care delivery. Seven grants out of 30 (totaling nearly 20 percent of the total budget of $3 million) appeared to the committee to fall outside priority areas.

In 1994, with its budget increased to $3 million, the TSNR Program listed 10 priority areas and specified that research applying to the military would be given highest priority. As shown in Table 3-5, the priority area "Evaluation of nursing/women's health programs/deployment" received the largest dollar value of the awards, followed by the area "Application of clinical nursing to a military environment." The committee's categorization indicated that 4 of the 10 priority areas designated in 1994 received no grants and that 25 percent of the awards,

TABLE 3-4 TriService Nursing Research Program Grant Awards, FY 1992–1993, by Priority Area, Total Number of Awards, and Amounts

	Number of Grants Funded			
Priority Area[a]	1992	1993	Total Grants Awarded	Total Amount Awarded ($)
Health care delivery	5	13	18	1,522,586
Family stress related to wartime separation/ injury	1	3	4	475,417
Access to health care	1	0	1	10,589
Child abuse	0	0	0	0
Lead poisoning	0	0	0	0
Subtotal	7	16	23	2,008,592
Other: Health of military personnel	1	6	7	468,349
Total	8	22	30	2,477,503

[a] Priority areas were identified in the 1992 and 1993 Requests for Proposals. The committee assigned each grant to one priority area.

Errata

P. 44, Table 3-4: in the "Total Amount Awarded" column, the "Total" value should be *$2,476,941* not *$2,477,503*.

TABLE 3-5 TriService Nursing Research Program Grant Awards, FY 1994, by Priority Area, Number of Awards, and Amounts

Priority Area[a]	Total Grants Awarded	Total Amount Awarded ($)
Application of clinical nursing to a military environment	5	689,743
Nursing interventions related to injury, trauma, burns, wound healing, evacuation, and long-term sequelae	5	142,677
Evaluation of nursing/women's health programs/deployment issues	4	812,612
Nursing interventions for military-related stress/adverse conditions	3	255,496
Nontraditional symptom management	1	355,225
Ethical/clinical decision making in a military nursing environment	1	100,880
Application of nursing interventions to field conditions	0	0
Technology applications to support nursing care in the field	0	0
Emergency nursing care for acute illness and trauma	0	0
Military service or deployment and spousal/ child abuse, preventive health care, and wellness promotion	0	0
Subtotal	19	2,356,633
Other (health adviser program evaluation, history of military nursing, pediatric care program, and military family health)	5	660,860
Total	24	3,017,493

[a] Priority areas were identified in the 1994 Request for Proposals. The committee assigned each grant to one priority area.

totaling $660,000, went to study topics (e.g., history of military nursing, health advisory program evaluation) outside the TSNR Program's priority areas.

The priority areas changed again in 1995, and the TSNR Program appropriation was increased to $5 million. Table 3-6 shows that of the 10 priority areas, "Women's health issues" and "Prevention of complications associated with battle injuries" received the highest number of awards and total funding.

The committee's synthesis of topic categories for all funding for the years 1992–1995 is presented in Table 3-7. After reviewing the data in this configuration, several conclusions were drawn.

The delivery of military health care is the category that has received most funding from the TSNR Program. This is important in that military health care is going through a number of transitions based on the need for cost containment in health care, access to health care issues, and a more peacetime health care service. For example, the new military managed care system known as Tricare has introduced a major change in health care delivery to beneficiaries.

Studies that address women's health issues have received the second-most TSNR Program funding. Since the proportion of women in the military is

TABLE 3-6 TriService Nursing Research Program Grant Awards, FY 1995, by Priority Area, Number of Awards, and Amounts

Priority Area[a]	Total Grants Awarded	Total Amount Awarded ($)
Women's health issues	6	1,768,738
Prevention of complications associated with battle injuries	6	1,038,333
Disease prevention/wellness	3	280,815
Readiness/deployability	3	166,826
Case management	2	243,844
Operational issues	1	163,526
Spousal/child abuse	0	0
Home care	0	0
Transportation of patients	0	0
Training of medevac personnel	0	0
Subtotal	21	3,662,082
Other (Air Force nursing history, low birth weight infants)	2	278,889
Total	23	3,940,971

[a] Priority areas were identified in the 1995 Request for Proposals. The committee assigned each grant to one priority area.

TABLE 3-7 Synthesis of TriService Nursing Research Program Grant Awards, FY 1992–1995, by Research Category,a Number of Awards, and Amounts

	Number					
Category	1992	1993	1994	1995	Total Grants Awarded	Total Amount Awarded ($)
Delivery of military health care	5	12	7	5	26	3,023,443
Women's health	1	3	3	5	12	2,497,251
Health of military personnel, readiness/ deployment	1	3	3	5	12	964,002
Nursing care interventions under field conditions	0	0	5	6	11	1,536,235
Health of military family	1	3	3	3	10	1,370,135
History of military nursing	0	1	2	1	4	223,361
Other	0	0	1	1	2	70,509
Total	8	22	24	23	77	9,684,936

[a] Identification of research categories and assignment of projects to those categories were performed by the committee.

Errata

P. 46, Table 3-7: in the "1995" column, the value for "Delivery of military health care" should be *2* not *5*.

Since 1994, 11 studies of nursing care under field conditions in the military have been funded by the TSNR Program. This topic is of obvious military relevance, and further work in this area should be encouraged through the funding of carefully selected studies.

growing and relatively few studies have been conducted on this population (IOM, 1995), strong support in this area is easily justified.

Studies concerning the health of military personnel, including their readiness for deployment, have been funded each year, and this category ranks fourth in funds awarded by the program. Substantial support in this area is desirable since one of the goals of the program is to develop nursing knowledge that is useful in the military setting.

Study Characteristics of TSNR Program Grants

As a further analysis of funded grants, the committee also categorized the 77 funded TSNR Program projects under six design parameters: (1) target population, (2) study population, (3) study design, (4) environment, (5) research topic, and (6) primary exposure. As can be seen in Table 3-8, this categorization

TABLE 3-8 Numbers of Funded TriService Nursing Research Program Projects by Study Characteristics

Characteristic	Number of Funded Studies[a]	Characteristic	Number of Funded Studies[a]
Target populations		Environment	
Military nurses	20	Inpatient	24
Families of military nurses	1	Outpatient	26
Other military beneficiaries	23	Combat setting	0
General (nonmilitary)	30	Normal working/living setting	19
Other	3	Laboratory	4
Study populations		Other	4
Families	9	Research topic	
Infants/prenatal	5	Trauma/injury	13
Children/adolescents	2	Infectious disease	2
Adults	53	Noninfectious disease/condition	13
Elderly	0	Perinatal/reproductive	5
Animal	5	General health	5
None	3	Health care utility and/or access	9
Study design		Psychosocial/behavioral	23
Experimental/randomized	22	Other	7
Quasiexperimental/nonrandomized	16	Primary exposure	
Observational (crosssectional)	22	Clinical health care intervention	39
Observational (longitudinal)	6	Psychosocial/behavioral	26
Qualitative	5	Environmental	4
Historical	6	Sociodemographic	0
		Other	8

[a] Each of the 77 studies was assigned to only one subcategory per characteristic. Thus, the total for *each* characteristic is 77.

of funded grants yields some interesting results. For example, although these studies were being conducted by military personnel, almost 40 percent focused on nonmilitary target populations. However, more than 25 percent focused specifically on military nurses. The largest single grouping (70 percent) focused on adults, whereas 12 percent focused on family issues. Nearly half were experimental or quasi experimental in design. The most common topic area was psychosocial/behavioral research (30 percent). Trauma/injury accounted for 17 percent, and infectious diseases, 3 percent.

The committee found evidence of attention to racial, ethnic, or cultural influences or issues in four studies funded by the TSNR Program (DeCasares, 1993; Giger, 1995; Johnson, 1995; Stotts, 1994), ranging from electrical stimulation and foot skin perfusion in black and white individuals with diabetes mellitus (Stotts, 1994) to coronary heart disease risk factors and behavioral risk reduction strategies for premenopausal African-American women (Giger, 1995). Other studies funded by the TSNR Program may address cultural issues, but they cannot be identified from review of the abstracts.

The committee recommends that the TSNR Program develop a system to categorize grants by research priorities and by other characteristics, such as those in Table 3-8, as part of its evaluation plan. These data could then be retrieved quickly to respond to inquiries.

RESEARCH DISSEMINATION AND UTILIZATION

The dissemination and utilization of research are integral aspects of the research process. In the field of nursing, the dissemination of nursing research results has already yielded many health benefits and cost savings for the public. Examples are provided by programs of research reported in the *Annual Review of Nursing Research* that have resulted in beneficial protocols: protocols that serve to protect battered women and their children (Campbell and Parker, 1992); endotracheal suctioning protocols that avoid adverse side effects such as hypoxia, mucosal trauma, and bronchospasm (Stone and Turner, 1990); protocols for inspiratory muscle training to improve functional status of the chronically ill (Kim, 1988); and protocols to manage acute pain, permit the reduced use of opiates, and minimize common opiate side effects (Hegyvary, 1993).

Military nurse researchers have a history of presenting research findings at conferences, especially those sponsored by the military. However, the committee found no articles that dealt with research utilization in military settings. In the civilian nursing research literature, findings related to a number of nursing interventions, such as those listed above, would have direct application and merit evaluation for field conditions or other settings unique to the military.

SUMMARY

The Army, Navy, and Air Force Nurse Corps each support the integral role of nursing research as the basis for nursing practice. Resources for nursing research differ among the military services, but each corps is seeking to strengthen its research environment. The TSNR Program is one mechanism to accomplish this.

Review of citations and abstracts for peer-reviewed articles related to military nursing research indicates a broad array of research topics but a relatively small number of studies. Most of the relevant research reports that actually address military nursing do not appear in scientific journals. The military services have paid close attention to historical lessons related to nursing research, and the TSNR Program has allowed further work in this area.

The TSNR Program's $9.7 million portfolio of 77 studies includes a wide range of topics, with the greatest proportion of awards and dollars given to studies dealing with the delivery of military health care.

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4

Program Execution

The TriService Nursing Research Program (TSNR Program) is established at the Uniformed Services University of the Health Sciences (USUHS), as recently mandated by Congress in the fiscal year (FY) 1996 Department of Defense Authorization Act (Chapter 104, title 10, U.S. Code as amended, see Chapter 1). The legislation further mandates that a TriService Nursing Research Group (TSNR Group) administer the program. The purpose of the TSNR Program is to facilitate research on the furnishing of care and services by nurses in the armed forces by expanding the body of scientific knowledge upon which military nursing practice is based. Background information about the TSNR Program was provided by the program or is based on data provided by the program. Supplementary information was provided by a small sample of funded and unfunded applicants.

In 1996, the chief of the Army Nurse Corps and the directors of the Navy and Air Force Nurse Corps agreed on the following goals for the TSNR Program (TriService Nursing Brief to the Institute of Medicine Committee on Military Nursing Research, January 27, 1996):

- continue its growth and improvement;
- identify, reduce, and eliminate barriers to research process and progress;
- strengthen existing bonds and create new bonds with civilian universities;
- maximize collaboration with triservice nurses who have research, doctoral backgrounds; and

- ensure ongoing, predictable levels of resource support (dollars and staff) for its researchers and for the TSNR Program itself.

The full text of these joint goals appears in Appendix C.

GENERAL PROGRAM ADMINISTRATION

The TSNR Group consists of six doctorally prepared military nurses, two each from the Army, Navy, and Air Force, representing both the active and the reserve components. Members are appointed by the chief and directors of the respective Nurse Corps. Length of experience as a TSNR Group member varies; however, continuity has been achieved through staggered terms. The position of chair of the TSNR Group rotates among the three services, and the intent is to have it rotate across the active and reserve components as well. To serve as chair, an individual must have served on the TSNR Group for at least 1 year prior to assuming leadership.

The TSNR Program currently fulfills its mandate to expand the body of knowledge upon which military nursing practice is based in two ways: first, by funding research proposals of active, reserve, and National Guard Nurse Corps officers, and second, by sponsoring grants-writing workshops for military nurse researchers.

Administration of the TSNR Program at Uniformed Services University of the Health Sciences

Daily administration of the program is handled by the director of the USUHS Office of Research Administration. This is consistent with the mission of USUHS, which ". . . serve[s] the uniformed services and the Nation as an outstanding academic health sciences center with a worldwide perspective for education, research, service, and consultation. . . ." The university is ". . . unique in relating these activities to military medicine, disaster medicine, and military medical readiness" (USUHS, 1996). The university is authorized to grant appropriate advanced degrees, to establish post-doctoral and postgraduate programs and technological institutes, to conduct medical readiness training and continuing education for uniformed members of the health professions, to prepare individuals for careers in the health professions in the uniformed services, and to award grants. USUHS serves all three military services as does the TSNR Program.

Administrative support of the TSNR Program within the Office of Research Administration currently consists of one full-time equivalent (FTE) clerk typist/ administrative assistant, 0.3 FTE GS-11 grants management specialist,

and 0.4 FTE overall program administrator. Administration costs were reported to be approximately $120 thousand annually for the first 4 years of operation, exclusive of the salary of the program administrator, who is a military officer. Space and certain other indirect costs were contributed by USUHS.

The director of the Office of Research Administration handles overall administration of the program, directs and oversees all grant actions, acts as executive secretary at meetings and teleconferences of the Scientific Review Panel, and prepares and disseminates executive summaries.

At the end of FY 1995, the Office of USUHS Research Administration subcontracted specific tasks in support of the TSNR Program. This $305,000 subcontract provides for a number of activities (see Box 4-1), including some not previously implemented by the TSNR Program. These new activities appear to be directed mainly toward improved program monitoring and dissemination.

Administration of Grants

The USUHS Office of Research Administration receives congressionally mandated funds for the TSNR Program from the Department of Defense (DOD) and channels them to an institution with which the principal investigator is affiliated or, at the principal investigator's request, to a not-for-profit foundation that provides grants administration. Many TSNR Program grants have been administered through nonprofit foundations, principally the Henry M. Jackson Foundation for the Advancement of Military Medicine—a private, not-for-profit organization chartered by Congress in 1983 to support medical research and education at USUHS and throughout the military medical community (Henry M. Jackson Foundation, 1996). The indirect costs of using the foundations have been approximately 14 to 16 percent.

The use of a foundation for grant administration by active-duty military personnel makes it possible for the investigator to spend grant funds for the study beyond the end date of the award. According to several grant recipients, it also allows the investigator to complete hiring actions and acquisition of materials in a timely manner and facilitates the hiring of the most qualified candidates for conducting research. The ability to hire personnel to aid in the research may be especially valuable for active-duty military nurse researchers for whom primary work responsibilities are clinical or administrative rather than research.

BOX 4-1 SUBCONTRACTOR SERVICES FOR THE TRISERVICE NURSING RESEARCH PROGRAM, FY 1996

Support for Peer Review of Proposals

- Assists in the selection of members of the peer review panel to provide scientific review of all proposals. Assists selection of primary and secondary reviewers for all proposals.
- Categorizes proposals submitted for funding consideration by subject area to facilitate identification of scientific expertise required for peer review.
- Provides two notetakers at each peer review panel discussion (approximately 3 days) to record comments. Using written reviews from primary and secondary reviewers, and the salient features of the written comments of the panel discussions from the notetakers, prepares summary reviews of proposals to be returned to each respective applicant.
- Composes positive and negative award letters and prepares them for mailing through the USUHS office.
- **Develops a database log to track the status of all submitted proposals.**
- **Develops a file/database of all active and reserve nurses who are master's or doctorally prepared or who are currently in an advanced degree program; lists clinical specialty/practice and area of research interest.**

Support for Program Management

- Develops and prepares presentation slides and viewgraphs for program briefings.
- Prepares program reports and information papers.
- Prepares program budgets and summaries.
- **Provides written review of semiannual and annual reports of funded research.**
- **Provides support for site visits to funded institutions.**
- **Develops, prepares, publishes, and disseminates a newsletter to provide program status and updates to program staff and awardees.**

Support for Grants-Writing Workshops

- Schedules and reserves meeting sites.
- Prepares packets of read-ahead materials for attendees.
- Prepares travel orders for program staff and attendees. Most are government travel requests executed by staff at USUHS.
- Provides on-site support in the form of two staff for meetings.

NOTE: Activities that are new to the TSNR Program are shown in **bold**.

REQUESTS FOR PROPOSALS

Dissemination

Requests for Proposals (RFPs) are disseminated by the USUHS Office of Research Administration. Deadlines for submission of applications have varied, depending on the availability of congressionally appropriated funds. In FY 1995, the $5 million appropriated and mandated by Congress for the TSNR Program was withheld by the DOD comptroller until May 4, 1995—seven months into the fiscal year—and the money had to be obligated by September 30, 1995, the end of the fiscal year. According to the 1995 chair of the TSNR Group, the late call for proposals severely limited the time for potential applicants to learn of the availability of funding and to prepare meritorious proposals that met deadlines mandated by the need to encumber funds. It also hampered the TSNR Program's ability to execute the mechanisms for peer review and to obligate the money most efficiently.

In FY 1996, the TSNR Program issued its call for proposals in December 1995, with the caveat: "It is anticipated that five million dollars will be available for military nursing research in FY 96." The Institute of Medicine (IOM) committee commends the TSNR Program for making the announcement well before funds were made available.

Current dissemination activity consists of distribution of the RFP to the offices of the Nurse Corps chief and directors, all commanders of military medical units, reserve nurse units, and all deans of graduate programs in civilian schools of nursing that have graduate programs. Anecdotal evidence from a small sample of grantees and unfunded applicants suggests that information about the TSNR Program funds has been received late.

Proposal Format

In this young competitive grants program, the format of proposal applications has evolved steadily, as shown in Table 4-1.

In 1994, for the first time, the RFP stated the primary goal of the program as "to improve nursing care for DOD beneficiaries by expanding the body of scientific knowledge upon which military nursing practice is based." The change in the award categories introduced stricter eligibility requirements. The RFP strongly encouraged new investigators to have a sponsor with research experience assist them with proposal development. Contact information for TSNR Group members was provided to assist new investigators in locating sponsors.

The RFP for FY 1996 introduces a notable change: funding support for up to 2 years for new investigators and up to 3 years for experienced investigators.

TABLE 4-1 Evolution of TriService Nursing Research Program Eligibilities and Requirements, FY 1992–1996

	Requirements				
Eligibility	1992	1993	1994	1995	1996
Military status	√	√	√	√	√
Minimum education	R.N.	R.N., Baccalaureate degree, PHS Form 398	R.N., Baccalaureate degree (depends on award category)	R.N., Baccalaureate degree (depends on award category)	R.N., Baccalaureate degree (depends on award category)
Application form	No form required	PHS Form 398	PHS Form 398	PHS Form 398, plus triservice application cover page	PHS Form 398, plus cover page with key words, and an additional page[a]
IRB approval required	√	√	√	√	√
American Association for Accreditation of Lab Animal Control facility[b]	Not specified	√	√	√	√
Disbursement of funds	Military installations and universities	Same as 1992	Use of a nonprofit foundation for grants administration or project work orders allowed for military installations	Same as 1994	Same as 1994 and 1995, plus universities and other nonprofit entities may receive grants directly from USUHS[c]

	Requirements				
Eligibility	1992	1993	1994	1995	1996
Award categories and funding caps, if any		Junior investigators,[d] cap of $75,000; senior investigators[e]	New investigators,[f] experienced investigators[g]	New investigators, experienced investigators	New investigators, $40,000/year; experienced investigators, $100,000/year
Period of award	1 year	1 year	1 year	1 year	2 years for new investigators; 3 years for experienced investigators

NOTE: PHS = Public Health Service

[a] Page requires a statement of relevance of the proposed research to military nursing and the way in which the research will expand the body of scientific knowledge upon which military nursing practice in based.

[b] Applicable only for animal studies.

[c] Uniformed Services University of the Health Sciences.

[d] Junior investigator: an applicant who has never been a designated principal investigator on any federal or privately supported research project for more than 3 years.

[e] Senior investigator: not defined.

[f] New investigator (FY 1994–1995): a licensed registered nurse with a minimum of a baccalaureate degree in nursing *or* a baccalaureate degree in another discipline and a graduate degree or candidacy in nursing.

[g] Experienced investigator: a licensed registered nurse who has previously received competitive research grants of at least $5,000 (excluding recipients of a National Research Service Award).

Budget proposals are required on a per annum basis for the number of years of support requested.

GRANT REVIEW PROCESS

The TSNR Program uses a three-level grant review process: In level 1, the Scientific Review Panel reviews proposals for scientific and technical merit. In level 2, the TSNR Group reviews recommendations of the Scientific Review Panel and considers programmatic issues, and in level 3, the corps chief and directors approve or disapprove recommendations from the TSNR Group based on service-specific priorities and relevance to military nursing. More specific information about each level follows.

Scientific Review Panel (Peer Review, Level 1)

Peer review is defined as the making of substantive evaluative judgments about scientific merit and the quality of scholarship and scholarly productivity. Peer review helps ensure that the conduct and reporting of research meet accepted scientific standards. The approaches to such assurance include the practice of peer review by study sections and advisory councils, the work of journal editors and referees, mock reviews by colleagues, and the process of collegial discourse. Because peer review is the primary mechanism for evaluating science and scientists, the committee closely examined the detailed information received about the peer review process used by the TSNR Program. The TSNR Program provided the following information about 1995 scientific peer review practices and procedures to the committee.

Proposals and Review Materials

The RFP instructs researchers to send a proposal plus a specified number of copies of the proposal to the USUHS Office of Research Administration by a specified date. Proposal packages are reviewed for format, checked for Institutional Review Board (IRB) submission, and processed for distribution to appropriate members of the Scientific Review Panel. This is an ad hoc committee of 18 persons, distributed among the three armed services with representation from the active and reserve components. Each member of the Scientific Review Panel receives a set of materials including the following:

- copies of all proposals;

- master list indicating the proposal number, title of the proposal, name and service affiliation of the principal investigator, and amount of funding requested;
- review criteria;
- outline of "review summaries" to be prepared by each primary and secondary reviewer for each proposal;
- listing of expected contents of review summaries (a brief description of the study, strengths of the proposal, weaknesses of the proposal, relevance to military nursing research, recommendations [including approval, modification, or disapproval and a priority score);
- a copy of the current RFP; and
- a list of proposals funded in previous years.

Selection of Scientific Review Panel Members

Each TSNR Group member identifies 6 candidates for the Scientific Review Panel from his or her respective service and component to form a pool of 36 triservice candidates. To be eligible for consideration, the individual must be an active member of the service and component represented by the TSNR Group member, have research knowledge demonstrated by an earned doctorate and research experience, and be available to review grant applications in advance and at the time of the deliberations. Current members of the TSNR Group and individuals who are submitting grants during the current funding cycle are excluded from consideration. An attempt is made to achieve diversity in terms of subject matter, knowledge of research methods, and position (administrative or clinical). Those candidates who can be available are asked for a curriculum vita.

Names, contact information, and curriculum vitae are provided to the program administrator who makes the final decisions regarding the match of proposal content and method with reviewer qualifications and with the stipulation that primary reviewers may not be from the same service as the individual submitting the proposal. The IOM committee notes that the pool of available reviewers is limited by the number of military nurses who meet the qualifications (see Chapter 3, Table 3–1).

In 1992, the decision was made to select only military active-duty and reserve nurses to serve on the annual Scientific Review Panel.

Chair of the Scientific Review Panel

The chair of the Scientific Review Panel is selected by the members of the TSNR Group, based upon service, rank, availability, and capability to manage

the panel. The chair reviews a smaller number of proposals than other panel members because of additional responsibilities that include ensuring adequate discussion of each proposal; accepting motions; counting votes; and assisting with the preparation of the final report, the vote tally, the "After Action Report" (an analysis of the process with recommendations for future improvements), and summaries for presentation to the corps chief and directors.

Orientation of the Scientific Review Panel

An orientation is held to facilitate group process since the panel members have never before worked as a group. As an ad hoc group, some panelists are first-time reviewers; a few have served on the panel for several years. Some will have attended one or more TSNR Group grants-writing workshops; some will not.

Deliberations and Priority Scoring System

In 1995, the stated purpose of the TSNR Program Scientific Review Panel was to review new and competitive renewal applications requesting funding. Under the direction of the chair, the Scientific Review Panel is expected to judge scientific merit in a manner whereby the integrity of individuals is preserved, proposals are rated, and summary statements cover the assessment of each proposal's scientific and technical merit. All meetings are held at USUHS. Since 1993, reviews have been completed in 3 days.

Meeting content includes

- discussion regarding conflict of interest and procedures to avoid conflict of interest,
- a review of the scoring system (see below), and
- closed-door deliberation of submitted proposals.

During deliberations, the primary and secondary reviewers present an oral review of the proposal. Members are expected to have read and become familiar with each application so that all can enter into the general discussion after written reviews have been presented. Discussion by all members of the Scientific Review Panel is followed by one of three motions (approval, approval with modifications, disapproval), and a voice vote by the entire Scientific Review Panel is recorded by the chair.

The category *approval* indicates that the application is of sufficient merit to be worthy of support. A vote for approval recommends that an award be made if sufficient funds are available. Reviewers may recommend accepting the

application as submitted or with adjustments in time, funding, or scope. Budgetary considerations are not be used in determining if an application is to be approved. The category *disapproval* is to be used for applications that are judged of insufficient merit to be worthy of support.

In 1995, the category *approval with modification* was used for applications that the Scientific Review Panel considered worthy of funding but judged to require either a minor change, clarification, or more information. These applications were to be managed in one of two ways:

1. While the Scientific Review Panel was in session, the principal investigator was contacted for the additional information. The panel postponed discussion until the information was received.
2. The Scientific Review Panel deferred the application because the principal investigator could not be reached or because it needed specific written information.

Three members of the Scientific Review Panel, at least one of whom was the primary or secondary reviewer, were assigned to a rereview panel for each application that was approved with modification. Each rereview panel was convened by teleconference for the discussion of and vote on the approval status of the application.

For approved proposals, each Scientific Review Panel member individually, and privately, records a numerical rating that reflects his or her own opinion of the scientific merit relative to the quality of the proposed research. The numerical rating is based on a scale from 1.0 (best) to 5.0 (the least acceptable rating) with increments of 0.1. If two or more members of the Scientific Review Panel vote against the majority recommendation, a minority critique must be provided.

The executive secretary gives each reviewed proposal a final three-digit score by averaging all reviewer ratings for each recommended application and multiplying each result by 100.

After the Scientific Review Panel meeting, the executive secretary prepares a summary statement of each application by combining written comments, minority critiques, and general Scientific Review Panel discussion notes. These statements become the official documents describing the deliberations of the panel.

Observations, comments, and recommendations are incorporated into After Action Reports after each Scientific Review Panel. These reports are intended to provide a basis for the maturing of the process of review. Generally, findings reported to the committee indicate that the critiques provided by assigned reviewers were through and complete; panel discussions were full, unbiased, and uninhibited; and the Scientific Review Panel had the requisite expertise.

Recurring observations in After Action Reports may lead to recommendations for consideration by the TSNR Group. Some of the most recent recommendations made by the executive secretary are listed below:

- Provide more discussion and advance information packets on roles, responsibilities, review criteria, and other issues related to proposal evaluation.
- Abandon the approval with modification in favor of the critique and a score that reflects the level of enthusiasm for the proposal.
- Establish and maintain mechanisms to ensure reviewer confidence in her or his scientific judgment of technical and scientific merit.
- Require a statement of a recommended score range by the primary and secondary reviewers, followed by independent scoring by individual reviewers at the end of the discussion.
- Use government observers who are independent of the peer review process to help ensure that every proposal receives an adequate, fair, and unbiased review.
- Review applications from new and experienced investigators separately.
- Establish multiyear awards.
- Reaffirm the confidentiality of the proceedings.
- Identify review panel trainees and invite them to attend the review cycle orientation and to observe the Scientific Review Panel deliberations.

Programmatic Review (Level 2)

Programmatic review is the second level of review, which is conducted by the TSNR Group. Information about programmatic review was provided primarily by the chair of the TSNR Group for 1995. Each TSNR Group member receives the complete set of grant application packets at least by the time they are sent to the Scientific Review Panel. To the extent possible, TSNR Group members observe Scientific Review Panel deliberations.

The 1995 chair of the TSNR Group stated that programmatic review is largely a qualitative endeavor in that the TSNR Group has not ranked the priorities, does not have established rules about funding levels for new and experienced investigators, and does not plan to apportion funding evenly across all services and components. The process used has changed each year.

In 1995, the TSNR Group reviewed each grant individually for the study's purpose, value to military nursing, preliminary Scientific Review Panel summary statement, and budget. The group sometimes overrode budgetary decisions made by the Scientific Review Panel—most often changing funding for computers and travel. The budget recommended by the TSNR Group was

Errata

P. 62: the third line from the bottom should read "sometimes overrode budgetary *recommendations*" not "budgetary *decisions*."

approved by consensus for each grant approved by the Scientific Review Panel. Proposals were grouped into thirds using the criteria of military relevance and Scientific Review Panel priority score. Proposals in the first and second tiers were recommended for programmatic approval. Those in the third tier were reviewed again, the scope of work was examined to determine if the aims and thus the budget could be reduced, and they were prioritized for approval until there were no more remaining funds.

Approval by the Nurse Corps Chief and Directors (Level 3)

According to information provided by the 1995 chair of the TSNR Group, final funding approval rests with the Nurse Corps chief and directors. At the annual meeting of the TSNR Group with the chief and directors, the TSNR Group provides updates about the status of the TSNR Program, funds spent or encumbered, funds available, recommendations for grant funding and for dispersal of remaining funds, and various other TSNR Group activities. Recommendations for awarding grants listed applications in order of merit using three categories ranging from the highest level of enthusiasm to a low level of enthusiasm.

Committee Recommendations Concerning the Grant Review Process

The committee commends the TSNR Program for its efforts to establish a process that emphasizes scientific merit as the basis for funding decisions. The committee notes that the intent of the TSNR Program is to model the peer review process after that used by the National Institutes of Health. Nonetheless, the committee has identified a number of ways in which the grant review process can be strengthened. The major recommendations appear below. Further detail is provided in Chapter 5.

- **Appoint a Scientific Review Panel chair who has experience in outside grant reviews and who shows evidence of being a seasoned leader in bringing about consensus and decision making in groups.** A chair who has served on outside scientific review panels would help to ensure fair and rigorous review, including the solicitation of critiques by outside experts for topic areas not adequately represented on the panel.
- **Include at least three nonmilitary scientists with experience on outside scientific review panels on the TSNR Program Scientific Review Panel.** This action would expand the pool of potential reviewers and make it possible for military panel members to benefit from exposure to scientists with experience on civilian research review panels. This action is consistent with

Major Werley's action to obtain consultation from R. Louise McManus in the early days of Walter Reed Army Medical Center (see Chapter 1).

- **Assign panelists to 3- to 4-year staggered terms.** Multiyear terms allow for the building of understanding and trust relationships; optimize the various strengths and expertise of the members; decrease the time required for learning the system and the review process; and facilitate the use of time for making good decisions. Since the panel meets only once yearly, a minimum of a 3-year term is necessary to have a majority of seasoned reviewers on the panel.
- **Discontinue the use of the recommendations to approve, approve with modification, or disapprove** as suggested in the 1995 TSNR Program After Action Report. **Instead, the panel is encouraged to use a full rating scale to evaluate proposals and establish a pay line to fund meritorious proposals.** The committee is especially concerned about the process of approving with modification, which allows deferred review of selected grants by a small number of reviewers.
- **During the annual grant review meeting, review proposals within the same award category as a group, using established criteria for each category**, also as recommended in the 1995 After Action Report. This process will help to ensure fair treatment since expectations vary widely for different types of grants. Explicit criteria need to be established in advance for each award category.
- **Conduct Scientific Review Panel meetings privately, with attendance only by the panel, ad hoc members, and the executive secretary.** Privacy ensures fairness and mitigates against possible intimidation or the impression of undue influence. It also ensures the separation of peer review for scientific merit from policy decisions related to such issues as program priorities and management.
- **Continue levels 2 and 3 of the review process, always using scientific excellence as the basic requirement for funding.**

RESEARCH TRAINING

Description

Research training under the TSNR Program is reported to consist of formal and informal mentoring and grants-writing workshops held in 1993, 1994, and 1995. The committee had access to notebooks containing materials for two workshops held in 1995. Review of these notebooks reveals carefully prepared materials, not limited to grants-writing, but also covering training in the research process. The workshops were in essence research tutorials provided over a period of 3 days. Content included the research process, research concepts,

research design, statistics, sampling techniques, instruments and measurement methods, data processing and analysis, and the formation of science networks. The workshops appear to have offered an opportunity to develop additional methodological skills and cognitive insights and to become part of the community of science, apparently in recognition that some potential applicants may have limited research experience.

Based on attendance lists provided by the TSNR Program, four 3-day grants-writing workshops held in 1994 had attendance ranging from 25 to 37 persons at each workshop. The committee matched names of attendees with names of grantees and unfunded applicants for TSNR Program grants in 1995. Of the 113 nonfaculty persons attending these workshops, 12 (11 percent) subsequently applied for TSNR Program grants. Of the 12 who submitted grant proposals, 5 (42 percent) were funded. The attendees who applied for grants represented 15 percent of all 1995 applicants and 22 percent of grant recipients for that year.

Anecdotal evidence from a small sample of grantees and unfunded applicants indicated that grants-writing workshop dissemination needs to occur more quickly and be planned to reach a broader audience.

Analysis and Recommendations for Improving Research Training

The workshops probably present too much material to absorb over 3 days and, if the participants are relatively inexperienced, not enough attention to first-time grants-writing, preparation of proposals and manuscripts, administration of funded projects, research counseling, and all the maze of details that can easily overwhelm the researcher. Nor is it apparent that there is attention to theoretical orientation, lifelong commitment to the development of knowledge in military nursing by programs of research, or the universal bases for making evaluative judgments about scholarly productivity (publication record, continuing research identity, etc.) that result in guidelines for practice.

A grant proposal sets forth both the exact nature of the matter to be investigated and a detailed account of the methods to be employed. In addition, the proposal usually contains material supporting the importance of the research topic and the appropriateness of the research methods to be employed. Thus, at the very least, more workshop time could be used to explore some common problems in developing proposals and wrestling with the parameters of the problematic nature of research, the search for serviceable hypotheses, the selection of sensitive means of analyzing data, and the creative tasks of study design necessary to produce a high quality proposal. The primary purpose of grants-writing workshops should be to polish skills already possessed.

The committee recommends that the TSNR Program develop comprehensive mechanisms for research training. This recommendation presumes continued support by the military Nurse Corps for doctoral education and the addition of post-doctoral fellowships for research training. Suggested mechanisms include the following.

Mechanisms for formal and informal mentoring of junior researchers. Several of the grant award categories recommended in Chapter 5 would foster mentoring, but additional mechanisms should be pursued as well.

Workshops on scientific writing. This focus would help military nurse researchers to publish their work in peer-reviewed journals and could also be beneficial in the preparation of future proposals.

Addition of the solicitation of advice and criticism for proposals and the use of mock reviews during the grants-writing workshops. Mock reviews are used widely to assist investigators in improving the quality of their proposals. They are critical analyses patterned after the National Institutes of Health review process but provided by local colleagues and other experts from inside and outside the military. Reviewers serving as knowledgeable skeptics offer commentary, support, coaching, and encouragement. There is precedent in this approach in that some schools of nursing use mock reviews for all extramural research applications. Mock reviews by colleagues help improve research design and interpretation and thus enhance the researcher's ability to develop a high-quality proposal.

Workshops in research methods. The purpose of these workshops would be to help refine the various research skills of junior nurse researchers.

PROGRAM MONITORING AND EVALUATION

Adequate and useful evaluation of programs allows those administering them to know the status of all activities at any point in time and to forecast the program's accomplishments and needs over reasonable time periods. Such capability requires systematic assembly of data and information concerning four aspects of the program: input, process, outcome, and impact. As is common with many new programs, systems for monitoring and evaluating the TSNR Program appear to be in the early stages of development.

Input Evaluation

Input evaluation requires knowledge of the monetary costs of administering various aspects of the program, personnel time commitments, space and equipment costs, time taken from other activities, etc. Detailed information of this type was not provided to the committee for review.

Process Evaluation

According to information provided to the committee, the TSNR Program has a number of mechanisms in place for evaluating the processes involved in program implementation.

Peer Review Process Evaluation

As described earlier in the discussion of scientific peer review, After Action Reports are written to describe the functioning of the panel and make recommendations to improve the process. Records indicate that many of the recommendations from 1994 and earlier were implemented in 1995. Additional recommendations were made after the 1995 review, but procedures for the 1996 Scientific Review Panel have not yet been announced.

Relevance of Past Grant Awards to Priority Areas

Beginning in FY 1995, the TSNR Program prepared a summary of the number of funded proposals in each of the stated research priorities for that year; the dollar amounts allocated to each priority area were not identified. Chapter 3 presents the committee's examination of this aspect of the program.

Relevance of Past Grant Awards to Military Nursing

Statements of the relevance of the research to military nursing have been required in awardees' final reports and are now being required in the application. Statements from the final reports appear in research monographs that summarize the portfolio of completed projects; however, the committee received no other materials that summarize the results. Review of the statements revealed that the following types of relevance to military nursing were cited frequently by the grantees:

- increased mission readiness and deployability;
- improved job satisfaction, reduced turnover;

- improved productivity;
- reduced manpower costs and health care costs;
- improved patient outcomes;
- reduced stress for active-duty personnel resulting from improved care of their dependents; and
- reduced loss of time from work resulting from pregnancy or health problems.

Documentation was not available to describe the production and dissemination of such benefits.

Distribution of Funds

In FY 1992–1995, $9.7 million (88 percent) of the $11 million appropriated for the TSNR Program was distributed to applicants. In 1995, approximately 80 percent of funds were awarded to applicants. The remainder was allocated for conduct of the scientific review panels, grant-writing workshops, and associated travel; subcontracted administrative support (see Box 4-1); this Institute of Medicine study; equipment and supplies; and civilian personnel (<1 percent).

Tables provided by the program suggest that close attention was paid to distribution of awards by service and component. Slightly revised presentations of the available data on the distribution of awards and funds appear in Tables 4-2 and 4-3, respectively.

The committee tabulated the following descriptive statistics about funding levels for the 1-year grants:

- For the 77 grants funded, the funding level ranged from $3,680 to $750,000.
- The mean level of funding was $125,654; the median was $74,232.
- The funding level for 23 of the 77 awards was less than $50,000.
- The funding level for 21 of the 77 awards was greater than the $125,000 mean.

The committee notes that the 1996 Request for Proposals gives upper limits on funding for experienced investigators as well as for new investigators, which would be expected to reduce the range of the funding levels.

TABLE 4-2 Number of Proposals Funded by and Submitted to the TriService Nursing Research Program, FY 1992–1995, by Service and Component

		Number									
		1992		1993		1994		1995		Total	
Service	Component	F	S	F	S	F	S	F	S	F	S
Army	Active	4	22	11	20	15	20	9	31	39	93
	Reserve	1	10	1	8	3	4	3	13	8	35
	Guard	0	1	1	2	1	2	0	0	2	5
	Subtotal	5	33	13	30	19	26	12	44	49	133
Navy	Active	2	17	4	9	3	9	2	5	11	40
	Reserve	0	2	0	7	0	2	5	10	5	21
	Subtotal	2	19	4	16	3	11	7	15	16	61
Air Force	Active	0	14	3	12	0	0	1	6	4	32
	Reserve	1	7	2	6	2	2	3	5	8	21
	Guard	0	0	0	0	0	0	0	0	0	0
	Subtotal	1	21	5	18	2	3	4	11	12	53
	Total	8	73	22	64	24	40	23	70	77	247
Percentage funded		11		34		60		33		31	

NOTE: F = funded; S = submitted.

Errata

P. 69, Table 4-2: This table is reproduced in its entirety.

TABLE 4-3 Proposals Submitted and Awarded, and Funding Requested and Awarded, for the TriService Nursing Research Program, FY 1992–1995

	Proposals		Funds ($ million)		
Year	Submitted	Awarded	Requested	Available	Awarded
1992	73	8	4.49	1.0	0.97
1993	64	22	4.17	2.0	1.70
1994	40	24	4.86	3.0	3.07[a]
1995	70	23	13.71	5.0	3.93
Total	247	77	27.24	11.0	9.68

[a] Funds had been carried over from FY 1993.

Errata

P. 69, Table 4-3: in the "Proposals Submitted" column, the values for 1992, 1993, 1995, and the total should be *66, 59, 78*, and *243*, respectively; in the "Funds Requested" column, the value for the total should be *27.23*; and in the "Funds Awarded" column, the value for the total should be *9.67*.

Academic Preparation of Awardees

The committee examined the academic preparation of the grant recipients across the 4 years of funding (Table 4-4). More than half of the successful applicants were prepared at the master's level only. Although available data were not conclusive, it appeared that a minimum of 9 and up to 11 of these master's-prepared grantees were enrolled in doctoral programs. One of the three awardees with only baccalaureate-level preparation was a predoctoral candidate, and the other two were students, but their course of study was not clearly identified. A majority of the awardees who were students were active-duty service members.

Reporting Requirements

To monitor the progress of research, the TSNR Program has instituted a number of reporting requirements, which include the following:

- The recipient must report any proposed changes in the principal investigator or continuation of the project in excess of 3 months without the participation of the principal investigator.
- A progress report must be submitted within 6 months of receipt of award contract.
- The progress report must include a summary of scientific and technical progress; a copy of the original budget; and information on disbursements, obligations, and commitments relative to personnel, supplies, and equipment.

TABLE 4-4 Academic Achievement of Grant Recipients in the TriService Nursing Research Program, FY 1992–1995[a]

	Doctoral Degree			Master's Degree				Bachelor's/Other	
Year	Ph.D.	D.N.Sc.	Ed.D.	M.S.N.	M.S.	M.A.	M.B.A	B.S.	Unspecified
1992	1	2	0	3	1	0	0	0	1
1993	7	2	0	12	0	0	0	1	0
1994	8	2	1	10	0	1	0	2	0
1995	6	4	1	9	0	0	1	1	1
Total	22	10	2	34	1	1	1	4	2

[a]Table indicates the highest degree level achieved by the grant recipients at the time of application.

- The final report must be submitted within 90 days of contract expiration.
- The final report must include a summary of scientific and technical results; any publications or presentations resulting from the grant; specific aims accomplished and their significance to military nursing; a financial status report (form SF 269); a Grantee's Release Form; and a Grantee's Assignment of Refunds, Rebates, and Credits Form.

Institute of Medicine staff had access to selected information in TSNR Program files at USUHS. Using standardized data collection forms, project staff abstracted data from files of 76 funded applicants (one was missing at the time of data collection). Data abstraction was conducted to obtain documented evidence about transfers of the principal investigator, requests for no-cost extensions, completed studies, self-reports of publications and presentations, and other matters relevant to process and outcome evaluation. Data were compiled, and results covering transfers, no-cost extensions, interim reports, and study completion for FY 1992–1994 are summarized in Table 4-5.

Data in Table 4-5 clearly indicate the common use of no-cost extensions by grantees. The grantees' files contain documentation of the need for additional time to complete projects. In at least one instance, the study was interrupted while the principal investigator was deployed to another country. Transfers and deployment are factors that may hamper study completion by military nurse

TABLE 4-5 Summary of Key Parameters of Grant Recipients and Their Studies for the TriService Nursing Research Group[a]

	PI[b] Transferred During Study		No-Cost Extension		Interim Report Filed		Study Completed[c]		
Year	Yes	No	Yes	No	Yes	No	Yes[d]	No[e]	Unknown
1992	0	8	1	7	8	0	8	0	0
1993	3	18	17	5	11	11	6	5	11
1994	3	21	25	9	19	5	1	13	10

[a] At the time of this writing, 1995 data are not yet available. The total number of grant recipients for FY 1992–1994 was 54.
[b] PI = principal investigator.
[c] The termination date for theses studies has passed, but there is no record of closure.
[d] Verifiable completion of the grant agreement, including submission of a final report.
[e] All 18 in this category have been granted extensions and are pending at the time of this writing.

Errata

P. 71, Table 4-5: in the "Study Completed" columns, the superscript "*c*" should be on "Yes," the superscript "*d*" on "No," and the superscript "*e*" on "Unknown."

researchers. Principal investigators responded to transfers by making arrangements for continuation of the projects by a different principal investigator or, if feasible, requesting no-cost extensions to allow completion of the project when time could be made available.

The committee concluded that TSNR Program records showed evidence of a need for additional monitoring. Interim reports were missing for 30 percent of the completed studies although reminder letters had been sent. The available documentation made it impossible to determine whether or not 21 of the studies had been completed even though their termination dates had passed. The newly subcontracted services (see Box 4-1) appear to be intended to improve program monitoring.

Outcome Evaluation

Publications and Presentations

Listings of publications and presentations are included in monographs compiled by staff of the TSNR Program. Although the results of many studies have been reported in poster sessions and research symposia, program files provided the title of only one journal publication that appears to have resulted from TSNR Program grants. However, because of the need for no-cost extensions, few studies had been completed before the end of FY 1994, and several were said to be in preparation or submitted.

A small amount of anecdotal evidence of outcomes was provided by a randomly selected group of nine grantees, only three of whom had completed their studies before 1995 (see Appendix A).

Value of Past Efforts in Mentoring New Investigators

Since the only information available about the mentoring of new investigators was provided in anecdotal form by grantees and by the chief of the Army Nurse Corps, the committee concludes that additional efforts are needed to develop relationships between new investigators and experienced investigators in nursing research and related disciplines.

Impact Evaluation

No impact evaluation has been conducted. This part of the evaluation process must evolve as part of the overall implementation of a comprehensive evaluation plan.

Conclusions and Recommendations Concerning Program Monitoring and Evaluation

The committee recognizes that the TSNR Program has implemented several forms of process evaluation, the most highly developed of which is the After Action Report that follows the Scientific Review Panel. However, it is clear that a comprehensive evaluation plan has not yet been implemented.

- **The committee recommends the early development and implementation of a plan for ongoing monitoring and evaluation of the TriService Nursing Research Program.** Recommended basic elements of such a plan are presented in Chapter 5. Data files should be established to facilitate analysis and reporting.
- In addition, the committee strongly urges the TSNR Group to monitor and report on the progress and outcomes of the program within 3 years and at regular intervals thereafter, as documented by systematic criteria that include evidence of peer-reviewed research publications and applications to practice.

SUMMARY

The committee recognizes that substantial progress has been made in managing the TSNR Program under very tight deadlines with limited resources. This chapter describes the administration of the program, the dissemination and evolution of Requests for Proposals, the grant review process, research training offered by the program, and program monitoring and evaluation. It also includes recommendations for improving scientific peer review, research training, and program evaluation and monitoring.

In addition, this chapter provides the basis for the following recommendations.

- **Appoint a full-time director for the TSNR Program, preferably a doctorally prepared military nurse researcher, to be housed at USUHS with adequate support staff.** To be done properly, research program administration requires the commitment of time and resources, scientific oversight, and the creation of partnerships that foster an environment that is conducive to maintaining and nurturing productive interactions among colleagues and the use of information and communication technologies. Ideally, the director would continue conducting research on a part-time basis.
- **Establish a consistent date for grant submission.** The committee believes that military nursing research would be best served if the TSNR

Program were treated as an ongoing program. It applauds early announcement of the possible availability of TSNR Program grant funds in FY 1996. It is easier to postpone starting dates than to postpone dates for submission and review of proposals.

- **Continue to enhance the distribution and timeliness of information about the program, the availability of program money for grants, and the schedule of grants-writing workshops or other research training mechanisms.** The use of electronic means for more widespread distribution should be considered, along with the preparation of notices for selected nursing and other journals.
- Explore ways for the three services to standardize, to the fullest extent possible, the Institutional Review Board process across military installations to facilitate multisite nursing research and proposal submission.

With regard to the delayed completion of many of the funded studies, the committee makes the following observations:

1. *Negotiated assignments for active-duty funded researchers would be a positive step toward supporting a productive military nursing research effort.* With some exceptions, the work of nursing research in the military is done in conjunction with other job responsibilities. It appears that the commitment of military nurses to research has been a key factor in conducting research while also fulfilling other demanding job expectations. Some grantees stated that they had been able to negotiate time reserved for research activities. Some have used grant money to support a staff that could complete the study under the grantee's supervision. The chief of the Army Nurse Corps states that Army nurse investigators typically have approximately a 10 percent release time from their official jobs to conduct research (B.H. Simmons, Army Nurse Corps, Falls Church, Va., memorandum dated February 15, 1996). Stabilization of assignments is not a new issue in the military, and protocols have been developed to address this matter. Therefore, the needs of specific researchers should be addressed under such protocols.
2. *A firmly established multiyear funding base would encourage and enhance focused research and development efforts that transcend any one corps.* Such a base is essential for effective forward planning, efficient operation, and highest return on DOD investment.

The following chapter presents the committee's conclusions and recommendations.

REFERENCES

Henry M. Jackson Foundation. 1996. Homepage at http://www.hjf.org/, 24 April.

USUHS (Uniformed Services University of the Health Sciences). 1996. USUHS Mission Statement at http://www.usuhs.mil/, 8 April.

5

Conclusions and Recommendations

Basic to the evolution of strong programs of military nursing research is the development of a culture deeply grounded in research and its use as a primary means for improving the military health care system. Creation of this culture requires commitment to generate the body of knowledge required to guide military nursing practice. In addition, it requires a commitment of time and resources, including extensive training, interdisciplinary and multidisciplinary interactions, and peer review of the proposed science.

The new era that results from this culture should increase the quality of scientists properly trained in nursing science as their primary field. It should generate new knowledge about the nature of military nursing, clarify the conceptual basis of military clinical practice, enhance the evaluation of clinical practices in the military, forecast health delivery system needs that can be met by military nurses, and expand the range and extent of influence of military nursing research. As the culture of the military nursing scientific community evolves, networking will build strong research groups through such strategies as use of the Internet, participation in conferences, and publication in journals.

In this emerging reality and era of rapid change, there is a need to develop nursing research that has high payoffs to military nursing practice. To meet this challenge, groups of military nurse researchers and their colleagues are encouraged to band together and, with other disciplines, ask important clinical questions and design and implement studies to answer them. In addition, mentoring is needed by pre- and post-doctoral students and fellows. This new research era should

- demonstrate the value of military nursing research and the critical nature of its relationship to military nursing practice,

- building the infrastructure and resources needed to facilitate military nursing research, and
- develop a commitment to generate the body of knowledge required to guide military nursing practice.

The creation of a research culture will yield a program of knowledge generation required to improve standards of military nursing practice and to improve the health of service members and their beneficiaries. It will contribute to understanding the uniqueness of nursing services in circumstances of war, peacetime operations, readiness, and deployment.

CONCLUSIONS

Depth and Breadth of Military Nursing Research

The research questions that must be addressed by military nurses are large in number and of great importance. Until recently, however, the number of military nurse scientists available to address these questions has been quite small, especially among the active component. The body of published peer-reviewed research focused on military nursing questions addresses a broad range of topics but is also small.

Role of the TriService Nursing Research Program

The TriService Nursing Research Program (TSNR Program) is central to improving nurses' capacity to carry out the mission of military nursing. Military nursing research is essential to expanding the body of knowledge needed to guide nursing practice that modern health care requires, not only for service members, but for their beneficiaries as well. Other sources of support for military nursing research appear to be severely limited. Despite the recent beginnings of the TSNR Program, it is showing modest success. The TSNR Program has begun to develop a body of research directly relevant to military health (see Chapter 3), to establish collaborative relationships with other scientists and disciplines, and to initiate a system for the development of novice researchers.

TriService Nursing Research Program Operation

From the inception of the TSNR Program, guidance was sought from the National Center for Nursing Research (now the National Institute of Nursing Research) to help build a strong and credible program. The request to the Institute

of Medicine to conduct this study is indicative of the program's desire to improve its operation and its potential impact on military nursing research and ultimately on clinical practice. The committee recognizes that the TSNR Program has been operating under circumstances that are far from ideal—with continued funding uncertain from year to year and serious delays in the receipt of funds. Nonetheless, the TriService Nursing Research Group (TSNR Group) and program administrator have taken many steps to strengthen the program. The committee especially applauds the very recent changes that allow funding for periods longer than one year and the specification of maximum funding levels for the two grant award categories. Multiyear funding can encourage and enhance focused research and development efforts that transcend any one corps.

The committee concludes that the TriService Nursing Research Group, which oversees the program, serves as a useful mechanism to ensure involvement of the individual services in the following areas: developing priorities, overseeing the procedures for the grant review process, approving the recommendations of the Scientific Review Panel, monitoring and reporting on the progress and accomplishments of the program, providing recommendations to the Department of Defense (DOD) principal staff assistant on an annual basis, and communicating activities of the TSNR Program to the triservice corps chief and directors annually, or more often, as necessary. The committee suggests that future functions of this group be expanded to include the following:

- Sponsor a biennial conference to establish research priorities for the program.
- Make use of varied technologies to foster rapid communication among military and civilian nurse scientists to disseminate research findings, share resources, and highlight contributions of military nurse researchers to military health care. Mechanisms might include use of the Internet, a newsletter, research journals, and conferences.
- Nurture and sustain relationships among active, reserve, and guard military nurse researchers and with nurse researchers with prior military service.
- Actively promote research that enhances military nursing practice and the administration of military health care programs.

Peer Review

Currently there is a fundamental problem in the peer review process: research proposals submitted by military nurses are reviewed exclusively by military personnel. This practice limits the pool of qualified reviewers and restricts scientific scrutiny. There is a burgeoning cadre of seasoned civilian nurse researchers who, if teamed with military reviewers, would greatly strengthen the review process.

MAJOR RECOMMENDATIONS

The Committee on Military Nursing Research recognizes the great need for a strong program of military nursing research and the infrastructure required for such a program. It has therefore developed the following recommendations.

- **The TriService Nursing Research Program should be continued into the foreseeable future.** This program is relatively young and the knowledge base is evolving. The program represents a modest investment for the benefits it will provide in improved health and cost outcomes for military personnel and their beneficiaries.
- **The TriService Nursing Research Program should have a stable, predictable funding base to develop and sustain research programs that have a positive impact on health care and the health status of military populations.** A dependable source of funds allows efficient program management and planning for their most effective use.
- **The TriService Nursing Research Program needs to be institutionalized in an operational sense.** To accomplish this, the TSNR Program needs to become a permanent component of the DOD Health Care Program and adequate funds to support the program should be incorporated into the DOD Health Care Program Objective Memorandum (POM). This change would eliminate dependence on yearly congressional appropriations, as has been the case in the past, and facilitate forward planning and efficient operation. Consistent with the language in the fiscal year (FY) 1996 Department of Defense Authorization Act (Chapter 104, title 10, U. S. Code as amended), the Uniformed Services University for the Health Sciences appears to this committee to be an appropriate element within DOD to be designated to manage and administer the program, with oversight by the TSNR Group.

RECOMMENDATIONS TO DEVELOP AND SUSTAIN A MILITARY NURSING SCIENTIFIC COMMUNITY

The development of a strong military nursing scientific community is integral to the productivity of a military nursing research program. To that end, the committee makes the following recommendations.

- **Give close attention to the responsible conduct of science.** Vigilance in adherence to ethical principles and maintenance of integrity in the conduct of science is a concern that pervades all of science, whether conducted in the military or civilian sector (IOM, 1989). Commitment to excellence in science demands that nurse investigators be socialized to the critical importance of

integrity in science. Ethical considerations are at least equal in importance to any other aspect of research.

The National Academy of Sciences' booklet *On Being A Scientist* (NAS, 1989, 1995) was developed in response to concerns about the ethical dimensions of the future careers of young scientists. The Institute of Medicine report *The Responsible Conduct of Research*, which fostered the writing of *On Being A Scientist*, briefly notes: "the value of mentoring should not be over-looked in institutional efforts to communicate responsible research practices" (IOM, 1989, p. 30). That report identified two important limitations in the role of mentors, however. First, institutions must recognize that the absence of support and rewards for mentoring are barriers to its effective occurrence. Second, the informal communications and other values socialization processes involved in mentoring may not be sufficient to ensure "awareness of the ethical and professional dimensions of research work" (IOM, 1989, p. 30).

Thus, there must be formal instruction in the ethical conduct of research that seeks to expose nurse investigators to the highest standards of investigative ethics. The conception, conduct, and dissemination of research and scholarly activity in military nursing must attend to the ethical framework within which research is conducted. The integrity of the individuals performing the investigations, and thus the credibility of the results, both merit attention.

In maintaining oversight of research ethics, the TSNR Program must continue to provide guidance and monitor the following:

1. procedures for monitoring the use of animal and human subjects,
2. consent procedures for human research,
3. inclusion of minorities and high-risk groups such as those with posttraumatic stress syndrome,
4. real or perceived conflicts of interest that may affect the investigator's judgment and behavior, and
5. appropriate procedures for defining the ownership of ideas and materials and the authorship of papers.

- **Develop mechanisms to facilitate programs of research rather than simply the completion of individual and possibly isolated projects.** Very few problems, whether theoretical or applied, are resolved by single studies. Most advances in knowledge result from the cumulative results of sustained research programs. Ordinarily, programmatic research is accomplished by the continuing efforts of an investigator or research team or by several teams conducting related research. The programs of research need to be directed to areas of relevance to military nursing and to encourage investigator-initiated research that fits into the overall program.

The requirements of military nursing careers may not easily accommodate the long-term involvement of individual investigators. Among many alternate mechanisms that might facilitate the development of programs of research are the following:

1. giving preference in funding to sound proposals coming from evolving but continuously productive research groups that publish their results in a timely fashion in peer-reviewed journals, or
2. the formation, perhaps by natural growth, of research centers through which nurse scientists might rotate and to which they might return as their careers and interests permit.

- **Increase mechanisms to recognize military nursing research and to provide for career advancement.** Because of the potential for programs of research to have a positive impact on nursing practice in the military and on health outcomes for service members and their beneficiaries, the committee encourages reconsideration of the mechanisms used to assign nurse scientists. Promising mechanisms for recognizing military nursing research include stabilization of assignments for those receiving research funding and wide recognition of contributions their research brings to the care of service members and their beneficiaries. The development of protocols for the initiation of research projects at the beginning of an assignment could help the researcher to obtain funding, complete the study, and prepare publications before reassignment.

  Currently, much of the research being conducted by active-duty nurse officers with funding by the TSNR Program is added to an already demanding duty schedule. Establishing programs of research would sanction research activities and expedite the scientific process.
- **Develop a cadre of nurse scientists in each service.** Mentoring, scientific writing workshops, grants-writing workshops, other technical assistance mechanisms, and support for continuing education all contribute to the development of skills of beginning and experienced nurse scientists. Formal and informal mentoring of junior researchers can pay dividends in their professional development and commitment to the advancement of nursing science. The value of creating opportunities to keep former military nurse researchers involved in overseeing the research process is clear: it utilizes talents and resources associated with experience. Structured mentoring programs are needed that include assigned mentors and that involve both education and support to facilitate the process of research dissemination. The need for scientific writing workshops is apparent from the small number of published research articles. Funding for participation in scientific meetings helps link nurse scientists with other researchers and disseminate study results.

Research utilization conferences can help incorporate research findings into practice.

- **Establish close linkages between the TriService Nursing Research Program and the larger arena of health care research and nursing research.** This can be achieved through the application of a rigorous peer review process; the formation and active involvement of a multidisciplinary advisory board; a director who is a doctorally prepared military nurse researcher; an increased emphasis on publication, especially of peer-reviewed research articles; and participation in science networks. The function of a multidisciplinary advisory group would be to provide input on strategic direction and program improvement, advise about prioritization of research, and facilitate communication within the military and civilian research communities. Members could be drawn from the National Institute of Nursing Research, the Association of Health Service Research, DOD Medical Research and Development, American Academy of Nurses, Sigma Theta Tau, and others.

OTHER RECOMMENDATIONS

Responding to the charge to the Institute of Medicine, the committee developed additional recommendations covering four key aspects of the program: (1) program management, (2) areas for future research funding, (3) allocation of resources to program functions and (4) identification of short- and long-term objectives.

Recommendations for Program Management

Management Structure

The committee deliberated on the existing management structure of the TSNR Program and recommends the following:

- **The TriService Nursing Research Group should continue to provide oversight to the program.** The TSNR Group founded the program and serves as a useful mechanism for ensuring appropriate attention to the needs of all three military services and components. The committee suggests that the TSNR Group consider expanding to include a senior Medical Corps officer who is a research scientist.
- **A doctorally prepared military nurse researcher should be employed as director of the TriService Nursing Research Program.** The committee believes it essential that the administrative mechanism be designed to manage the program; implement reporting requirements; conduct evaluations; provide for consistent structure and continuity in the TSNR Program grants and

research support effort; address the scientific conduct of research, and cultivate a network of research support, research training, and career development. Strategic direction of the program requires the expertise and the dedication of a full-time, doctorally prepared nurse researcher. Ideally, the director would continue conducting research on a part-time basis, thus serving as a role model and mentor for military nurse researchers.

Strategic direction of the program requires a full-time position and adequate support personnel and budget. Recent retirees or members of the reserve or guard components would have the advantage of bringing a military perspective with less chance of causing the discontinuity that results from reassignment of active-duty personnel. On the other hand, an active-duty position that would rotate among the military Nurse Corps could be advantageous in the recruitment and retention of outstanding military nurse researchers.

Application Process

The committee recommends that there be a permanent yearly submission date to facilitate the preparation of complete and well thought-out proposals. The committee also recommends that the form used by Institutional Review Boards at different medical facilities be standardized for each service (if not for all three services), to streamline the application and decision-making process.

Grant Review Process

Peer Review for Scientific and Technical Merit. The mechanisms used for peer review should be consistent with those used by such bodies as the National Institutes of Health.

- To achieve this, **the chair of the TriService Nursing Research Program Scientific Review Panel should have experience in outside grant reviews, and he or she should show evidence of being a seasoned leader in bringing about consensus and decision making in groups.**
- **The committee strongly recommends that the peer review panel continue to consist of 15 to 20 individuals, no fewer than 3 of whom should be nonmilitary scientists and scholars.** The nonmilitary reviewers must have experience on peer review committees for research, for example, of proposals submitted to the Division of Research Grants of the National Institutes of Health, or peer review committees in research programs such as those of as the American Heart Association or the American Cancer Society. The rest of the

panel shall consist of doctorally prepared nurses from the active, reserve, and guard components, with representation from each of the services. The members would be assigned staggered terms of 3 to 4 years. If there is not the necessary expertise on the panel for review of individual grants, collateral ad hoc reviewers should be sought.

- **During the annual grant review meeting, proposals within the same award category should be reviewed as a group, using established criteria for each category**, as recommended in the 1995 After Action Report (see Chapter 4). This process will help to ensure fair treatment since expectations vary widely for different types of grants. Explicit criteria need to be established in advance for each award category.

Other Review Considerations. **The primary criterion for awarding grants should continue to be scientific excellence.** The peer review panel would classify the relevance of the proposed study to military nursing as high, moderate, or low; but this classification would not be considered in the determination of scientific excellence. Once scientific excellence has been established, programmatic relevance is the next level of review (level 2). That is, when the advisory council (TSNR Group) receives more excellent proposals than it can fund, the awards would go to the proposals that best meet the programmatic goals of military nursing and that describe satisfactory contingency plans for deployment.

As a new recommendation, members of the Scientific Review Panel may submit grant applications during their term of office on the panel; however, they may not be physically present in the room during the review of their grant applications, and no committee member may talk with them about the review. If at all possible, the applicant should be excused from the entire peer review at that submission time and be replaced by another ad hoc member who has the same expertise. The committee realizes that most guidelines for conflict of interest should prohibit study sections from reviewing applications submitted by their own members and prohibit panel members from participating in reviews of applications from their own institutions. The committee agrees that the primary reviewer should not be from the same institution. However, because of the small number of doctorally prepared nurses in the military, the committee recommends the slightly different conflict-of-interest guideline described above to facilitate the growth of military nursing research without hampering peer review. The committee further recommends allowing the primary reviewer to be from the same service. Disallowing primary review by a member of the same service is unnecessarily restrictive, especially since areas of expertise may be concentrated in a service.

Evaluation

Well-conceived and implemented evaluation is integral to the success of any program. Evaluation mechanisms are most effective if introduced in the early phase of the program. The committee strongly recommends the following:

- **Develop and implement a plan for ongoing monitoring and evaluation of the TriService Nursing Research Program.** Recommended basic elements of such a plan are presented in Box 5-1. Data files should be established to facilitate analysis and report generation.
- Conduct outcome and impact evaluations of the program within 3 years and at scheduled intervals, as documented by systematic criteria that include evidence of peer-reviewed research publications and applications to practice.

Recommendations for Areas of Research

The research agenda for the TSNR Program was initially established by legislation and has included broad areas of research. The committee agreed that these areas of research should complement those currently receiving priority attention from the National Institute of Nursing Research and the Department of Veterans Affairs. In particular, they should give attention to contexts of care that are peculiar to or highly prevalent in the military. Proposals for basic and clinical research programs must have the potential ultimately to improve patient care and guide practice.

The committee recommends that future research be focused primarily in four broad areas, as described below. In addition, the committee recommends that the TriService Nursing Research Group hold a conference to set a research agenda on a regular basis (e.g., biennially).

1. **Current and emerging issues or problems with clear and direct application to military nursing care during wartime and operations other than war:** The focus here is on improvement of the results of nursing services under circumstances that are directly applicable to the military. Examples of research topics include the prevention of complications associated with battle injuries; staffing of aircraft for transportation of large numbers of stabilized and unstable patients; nursing health care issues related to rapid deployment; protection against adverse interactions of the human and physical environments; and preventive health measures during deployment. Consideration should be

BOX 5-1 RECOMMENDED ELEMENTS OF ONGOING MONITORING AND EVALUATION OF THE TRISERVICE NURSING RESEARCH PROGRAM

Input Evaluation

- Administrative costs

1. Costs of review process
2. Personnel costs, including indirect

- Funds allocated to each project
- Full-time equivalent commitments to research and their dollar value
- Actual time taken from other military duties
- Value and marginal costs of space and equipment
- Time taken from other activities by research subjects

Process Evaluation

- Peer review process

1. Grants received and reviewed
2. Approval rates
3. Composition of review panels

- Results of the review process

1. Quality of studies
2. Qualifications of investigators
3. Adequacy of research settings

- Completion of projects and fulfillment of reporting requirements

Outcome Evaluation

- Publications
- Other forms of dissemination

Impact Evaluation

- Citation counts
- Impact on costs of health and medical services, quality of life of service members and their families, readiness of military units, return to service of personnel—as possible
- Impact on the careers of military nurses

1. Subsequent research productivity
2. Professional recognition

given to the development of research capabilities for circumstances of deployment. Military deployments often occur suddenly and evolve into circumstances that present both challenges to nursing practice and opportunities for gains in knowledge not often available in civilian settings. The development of a structure with plans and tactics in place to facilitate investigation of important nursing problems could be a distinct opportunity for and contribution of military nursing research.

2. **Current and emerging issues or problems related to the diverse needs of service members and their beneficiaries during peacetime, with consideration of the contextually different aspects of care in the military:** The focus should be on supporting or validating nursing science to enhance the practice of nursing that will improve patient care outcomes and/or result in efficient resource utilization. Examples include but are not limited to the following: studies of nursing care measures that will reduce problems when postpartum women return to duty; health promotion measures targeted to staying within body weight limits after smoking cessation; disease prevention measures such as exercise and stress reduction; protection against excessive incidents of violence in the workplace; prevention of spousal and child abuse; military health systems organization and care delivery (e.g., managed care, case management, and home care management).
3. **Cultural aspects of military nursing:** Military nursing affords extensive opportunities to examine cultural implications and dimensions of the provision of nursing care to service members and their beneficiaries. For example, a large number of service members and their beneficiaries are from racial and ethnic minority groups, spouses may be from countries other than the United States, and care may be delivered to many military or civilian individuals from a host country. Nursing recognizes that culture helps shape the definition of health and illness and interpret human responses to physiologic and biological changes.

   The committee urges investigators to formulate research questions that address nursing care problems and opportunities related to this rich exposure to cultural differences. These may include the ways in which culture can constrain access to health care, the need for health care providers to adjust their traditional moral values and approaches to care, the identification of culturally-appropriate educational strategies, and the influence of culture on ethical recommendations. Attention to cultural aspects of nursing care could have far-reaching benefits in the military and civilian sectors alike. The most obvious benefit of research that leads to cultural competence is excellence in practice. Cultural competence involves the awareness of cultural differences and the integration of this awareness into practical skills that enhance one's ability to serve a diverse population.
4. **Evaluation of research utilization and clinical relevance:** Although scientific advances are apparent within nursing research, the interval between discovery and utilization in practice must be shortened to ensure timely

incorporation of findings into the provision of military nursing care. Military nursing must develop efficient processes to implement care recommendations and direct research-based information to practitioners. An example in this area would be the preparation of guidelines for practice based upon findings of programs of research. This area of research provides a process by which research results can be reviewed, evaluated, and implemented into nursing care, with evaluation of the practice implementation under conditions relevant to the military. The overall goal is to facilitate state-of-the-science standards of care.

These four recommended areas of research encompass research topics identified in previous congressional authorizations of the TSNR Program. They were based upon the committee's review of presentations by members of the military Nurse Corps, examination of results from literature searches, review of past and current research funding, and deliberations concerning the need for further research that addresses the unique needs of military nursing. In seeking proposals, the committee urges the TSNR Program to encourage applicants to build on and further develop strengths to achieve and develop a strong program of research. This process could be greatly enhanced by a priority-setting conference. The committee encourages collaborative research with investigators from other institutions and other disciplines. Such an interdisciplinary approach facilitates strong research and enables scientists to be at the forefront of their research area. Use of expert interdisciplinary teams with the sets of skills necessary to address strategic research questions productively would help produce positive impacts on the health of military populations. The development and focusing of research resources should be an outcome of implementation of the recommendations in this report.

- **The committee recommends the setting of priorities for funding that would lead to a focused portfolio of research aimed at specific areas of importance to military nursing.** The priorities for research funding would be developed by the TSNR Program following one of several conventional processes for strategic planning and consensus building for research priorities. Since investigator-initiated research is often creative, innovative, and highly productive, priority areas should be sufficiently broad to accommodate a range of investigator interests, including partnerships with basic scientists whose work has relevance to military nursing.

Recommendations for Allocations of Funds

The committee recommends that approximately 10 percent of appropriated funds be used to cover administrative costs, which are to include workshops, conferences, and travel support in addition to funds needed for essential

program operation. The remainder of funds should be used for the various grant awards.

Recommendations for Grant Award Categories

The committee recommends expanding the current grant award categories and using more stringent requirements for grant applicants, as indicated below. It provides recommendations for award categories for the short term and for incorporating a long-term strategy to augment current award categories as funds and other resources allow. The committee encourages flexibility for the awarding group in terms of the distribution of awards among various categories.

Short-Term Goals for Grant Award Categories

The committee recommends *continuing* the current grant award categories —Experienced Investigator Award and New Investigator Award—with the specifications given below, and adding: (1) Senior Investigator Awards, and (2) Utilization and Evaluation of Research-into-Practice Awards.

Although two of the award categories remain the same, the committee recommends the use of more stringent requirements for grant applicants, as indicated under each of the categories below. Suggested maximum funding levels are given, but the committee advises that funding decisions and levels be made carefully in light of limited resources and that funding generally not exceed that for comparable work in such other agencies as the National Institute for Nursing Research. Funding in excess of $200,000 per year should be examined with great care but not necessarily prohibited.

Experienced Investigator Awards. Experienced Investigators are licensed registered nurses who fulfill one of the following criteria: (1) military nurses with a doctoral degree or (2) military nurses with a master's degree who have a co-principal investigator with a doctoral degree. The co-principal investigator may or may not be in the military and may have his or her doctoral degree in nursing or another discipline. To qualify as an experienced investigator, the applicant should have capability in investigation as demonstrated by completed research, publication of peer-reviewed research papers, and presentations at national or international professional meetings.

- Awards will support research for 1, 2, or 3 years.
- The suggested maximum funding level is $200,000 per year inclusive of direct and indirect costs.

- Active, reserve, and guard nurses in all services are eligible to apply for this funding.

New Investigator Awards. New investigators are defined as licensed registered nurses who fulfill one of the following criteria: (1) military nurses with a doctoral degree, (2) military nurses with a master's degree who have a co-principal investigator with a doctoral degree, or (3) military nurses in a doctoral degree program who request funding for a dissertation proposal. The co-principal investigator of criterion (2) may or may not be in the military and may have the doctoral degree in nursing or another discipline.

- Awards will support research for 1 or 2 years.
- The suggested maximum funding level is $40,000 per year inclusive of direct and indirect costs.
- Active, reserve, and guard nurses in all services are eligible to apply for this funding.

Senior Investigator Awards. Doctorally prepared nurses who have been out of service (active, reserve, or guard) for less than 3 years in the Army, Navy, or Air Force are eligible to apply. The applicant must show evidence of an established program of research with multiple articles published in the peer-reviewed literature; must include a co-principal investigator who is currently an active, reserve, or guard nurse in the Army, Navy, or Air Force; and must provide evidence of current institutional resources to carry out the proposed research.

The goal of this new award is to retain the special expertise of experienced investigators within the military arena, facilitate mentoring, and enhance possibilities for the career trajectory.

- Awards will support research for 1, 2, or 3 years.
- The suggested maximum funding level is $200,000 per year inclusive of direct and indirect costs.

Utilization and Evaluation of Research-into-Practice Award. Active, reserve, and guard nurses in all services who fulfill one of the following criteria are eligible: (1) nurses with a doctoral degree or (2) nurses with a master's degree who have a co-principal investigator with a doctoral degree. The suggested maximum funding level is $40,000 for 1 year. The committee recommends that the TSNR Group establish a policy concerning the priority that it wants to place on this type of study.

The goal of this special award is to improve nursing care for DOD service members and beneficiaries by providing a process by which research results can be reviewed, evaluated, and implemented into nursing care—followed by

evaluation of practice implementation. The overall goal is to facilitate state-of-the-science standards of care.

Long-Term Goals for Grant Award Categories

The committee recommends the addition of the following funding mechanisms as long-term goals, to the extent that funding allows:

- infrastructure enhancement awards,
- post-doctoral fellowships for research training, and
- centers of excellence.

Infrastructure Enhancement Awards. The suggested award level is approximately $20,000 to $50,000 for 1 year. Active, reserve, and guard nurses in all services would be eligible to apply for this funding.

Research in military nursing may be facilitated by improved access to institutional resources that are appropriate for sharing. Examples include, but are not limited to

- systems of instrumentation including computers;
- development of registries of patient outcomes (such as hemorrhage or dehydration) during different modes of air evacuation;
- development of registries of follow-up data on DOD beneficiaries before, during, and after deployment; and
- development of software for telemedicine and other information systems pertinent to military nursing delivery of care.

The committee encourages the broadest use of research resources in the military installations that are enhanced by these awards, including multidisciplinary research. Accordingly, the committee recommends that applicants specify how such resources will be made available to at least three other military scientists who have ongoing funded research projects.

Mentored Research Investigator Awards. The suggested award level is $40,000 per year for a period of 1 or 2 years, inclusive of a discretionary travel fund to work with a mentor who is an established scientist.

After finishing doctoral preparation in a 3-year period, military nurses are at a critical juncture. Many have not had the necessary preparation in research to become established scientists. Giving talented investigators adequate mentorship in research offers one of the best opportunities to accelerate the pace of advance of empirically based nursing care for DOD beneficiaries.

The post-doctoral mentorship concept usually implies a freeing of military nurses from some of their clinical responsibilities so that they can devote most of their time to research. The committee recognizes that the latter will involve an authorization of a change in role expectations for military nurses that is beyond the committee's purview. Thus, the committee recommends research mentorship for military nurses as a long-range goal.

Centers of Excellence in Military Nursing Research. To optimize the career development of military nurse researchers and to enhance the probability of successful completion of grants awarded by this program to active-duty military nurses, it is highly desirable that Centers of Excellence in Military Nursing Research be included in the organizational structure of a significant number of armed services' medical centers of treatment facilities. These centers would be incorporated in the mission of the medical center or hospital and would be appropriately staffed with active-duty nurses who have advanced research training and who have been assigned to nurse researcher validated positions (doctoral or master's level). The primary duty assignment would be to conduct and manage military nursing research projects funded by the TSNR program and to develop and mentor the research training of junior officers. The chief or director of the respective Nurse Corps should ensure that nurses assigned to these positions are stabilized for at least 3 to 4 years so that they will have sufficient opportunity to develop research proposals and complete their projects in order to publish the results prior to moving to another assignment.

Centers of Excellence in Military Nursing Research would require a disproportionately large amount of funding from the current fiscal year's TSNR Program funds and would limit the development of military nursing research to one or two military facilities nationally. Therefore, the committee recommends the funding of centers of excellence as a long-range goal for military nursing research, with careful consideration given to triservice active, reserve, and guard representation at such centers.

With the implementation of these recommendations and others contained in the earlier chapters, the TSNR Program has the potential to evolve into a strong force for the advancement of military nursing practice.

REFERENCES

IOM (Institute of Medicine). 1989. The Responsible Conduct of Research in the Health Sciences. Committee on the Responsible Conduct of Research, Division of Health Sciences Policy . Washington, DC: National Academy Press.

NAS (National Academy of Sciences). 1989. On Being a Scientist: Responsible Conduct in Research. Committee on the Conduct of Science. Washington, DC: National Academy Press.

NAS (National Academy of Sciences). 1995. On Being A Scientist: Responsible Conduct in Research, 2nd ed. Committee on Science, Engineering, and Public Policy. Washington, DC: National Academy Press.

Acronyms

5—FU	5—fluoruracil
AFB	Air Force Base
AMEDD	Army Medical Department
AMSUS	Association of Military Surgeons of the United States
AMC	Army Medical Center
ANC	Army Nurse Corps
CINAHL	Cumulative Index to Nursing and Allied Health Literature
CRISP	Computer Retrieval of Information on Scientific Projects
CVCs	Central Venous Catheters
DTIC	Defense Technical Information Center
DROLS	Defense Research On-Line System
DOD	Department of Defense
FedRIP	Federal Research in Progress
FTE	Full-time Equivalent
FY	Fiscal Year
HIV/AIDS	Human Immunovirus/Acquired Immune Deficiency Syndrome
H—STAR	Health Services/Technology Assessment Research
IRB	Institutional Review Board
IOM	Institute of Medicine
POM	Program Objective Memorandum
MRSS	Military Recruiter Stress Scale
NATO	North American Treaty Organization
NINR	National Institute of Nursing Research
NROTC	Navy Reserve Officer Training Corps
NTIS	National Technical Information System

RDT&E	Research, Development, Test, and Evaluation
RFP	Request for Proposal
TSNR	TriService Nursing Research
USUHS	Uniformed Services University of the Health Sciences
VA	Veterans Affairs

Appendix A

Questionnaire and Results Summary for Funded Applicants

QUESTIONNAIRE TO TRISERVICE NURSING RESEARCH PROGRAM GRANTEES

ID# _____
Active Duty _____
Reserve _____
Guard _____
INSTRUCTIONS: Please complete each question in the space provided.

Projection Completion and Dissemination

1. Year and Title of research project
Year Funded _____
Title
_____
____

2. Was your TriService research project completed? (circle response)
YES NO
3. Approximate date of completion _____

4. Have you published any books, chapters, articles, or abstracts since completion of the funded research, beyond those listed in your interim and final reports, including both submitted and published work? (circle response)

YES NO

5. If yes, please provide the title and reference for your publication. _____

_____

_____

6. If the project was not completed, was it interrupted? (circle response)

YES NO

7. Why and for how long? _____

_____

_____

8. Did any post-funding research evolve from the original funded project, including non-TSNRP grants? (circle response)

YES NO

9. Please provide a brief description. _____

_____

_____

Effects on Practice

10. To your knowledge, have the results of your study(ies) influenced nursing practice in the military setting? (circle one)

YES NO Unknown

11. Please specify the setting and the change(s). _____

_____

_____

_____

_____

12. To your knowledge, have the results of your study(ies) influenced nursing practice in a setting other than the military? (circle one)

YES NO Unknown

13. Please briefly describe the setting and the change(s). _____

_____

_____

14. Have you been contacted by other health care providers or administrators for information about your study results? (circle one)

YES NO

Comments

_____

_____

15. To your knowledge, has your funded research been cited in articles on nursing practices? (circle one)

YES No Unknown

16. Please provide the citation(s). _____

_____

_____

Effects on Career Trajectory

17. Were you funded on your first application? (circle response)

YES NO

(If yes, skip to question 21.)

18. Did you find the reviewers' comments helpful in the development of any subsequent proposal(s)? (circle response)

YES NO

19. If you reapplied, was the subsequent proposal funded? (circle response)

YES NO

20. Briefly describe how the reviewers' comments could have been improved. _____

_____

_____

21. After you were funded through the TriService Nursing Research Program, did you do any of the following?

___YES ___NO Attend research conference(s).

___YES ___NO Present at research conference(s), including poster sessions.

___YES ___NO Request assignment to doctoral/post-doctoral training program. (Circle which type of program.)

___YES ___NO Enroll in doctoral/post-doctoral program.

___YES ___NO Other. Please describe.

_____

_____

_____

_____

22. How has the funded project affected your military career development?

___No effect recognized ___Reassignments

___Promotions ___Other (Please explain)

Comments

_____

_____

_____

_____

23. How has the funded project affected your health care professional career development?

___No effect recognized ___New position(s)

___Promotions ___Other (Please explain)

Comments

_____

_____

_____

_____

24. How do you think that your recent experiences with research funding might influence your plans and expectations for the future?

_____

_____

_____

_____

25a. In what type of facility do you presently work, such as base hospital, university, etc.?

25b. Are there factors that significantly influence your productivity and ability to conduct research in your current setting? (circle one) (e.g., no lab space, insufficient personnel, no dedicated time)

YES NO

25c. Please list these factors.

_____

_____

_____

_____

QUESTIONNAIRE RESULTS NINE FUNDED TRISERVICE NURSING RESEARCH PROGRAM GRANT RECIPIENTS1

(5 Active Duty, 4 Reserve)

1. After you received the reviewers' comments, did you find them helpful in the development of any subsequent proposal(s)?

Yes (3) No (2) N/A[2] (1)

2. What did you think of the reviewers' comments?

Comments were:

Good/Helpful (3) Inaccurate/Not Relevant (3) N/A (3)

3. Since you applied for a grant from the TriService Nursing Research Program, did you do any of the following? Check all that apply.

Yes	No	
6	1	Attend research conference(s)
6	2	Present at research conference(s)
2	1	Request assignment to doctoral/post-doctoral program[3]
1	1	Enroll in doctoral/post-doctoral program

4. How has the funded project affected your military career development?

No effect recognized[4] (2) Reassignments (1)

Promotions (3) N/A (1)

Other:

(a) Unknown since grantee is still a graduate student.

(b) Gave credibility in current assignment.

[1] NOTE: Numbers on Questionnaire to TriService Nursing Research Program Grantees do not necessarily correspond to numbers for Questionnaire Results. The number of respondents for an item is in parentheses.

[2] N/A = Not Applicable.

[3] Out of the nine, seven respondents either had a doctorate or were enrolled prior to applying.

[4] One grantee listed funding as input for his or her fitness report, but the Commanding Officer refused to include it.

(c) Has increased grantee's interest in remaining in the military.

5. Has the funded project affected your health care professional career development?

No effect recognized (2) Reassignments (0)

Promotions (1) N/A (1)

Other:

(a) Acceptance into doctoral program.

(b) Funding allowed grantee to improve quality of research.

(c) Experience gained.

(d) Receiving funds affects grantee's ability to continue in chosen research trajectory.

(e) Received a raise.

6. Do you think your recent experiences with research funding might influence your plans and expectations for the future?[5]

(a) Will absolutely continue research track.

(b) Positive experience. Will submit other grant proposals.

(c) Experience will help grantee to decide what is important and feasible.

(d) Prepared grantee (to apply) for NIH grants.

(e) Experience will help to conduct future research.

7. What are some factors that significantly influence your productivity and ability to conduct research in your current setting?

(a) Workload.

(b) No dedicated time.

(c) Nursing research department fully supports research endeavors.

(d) Full time student, therefore easy to conduct research.

(e) Given time to develop grant versus other military duties.

(f) Military facility contributed research personnel.

(g) Funding allows release from other academic assignments.

(h) Space.

(i) Working through university bid system is slow.

(j) Human subjects approval required from all three services. Six months through Navy.

8. Was your TriService Research Project completed?

Yes (3) No (2) N/A (4), 1995 Funding

[5] Sample comments follow.

9. Have you published any books, chapters, articles, or abstracts since completion of the funded research, beyond those listed in your interim and final reports?

Yes (3) No (2) N/A (4)

10. Did any post-funding research evolve from the original funded project?

Yes (2) No (5) N/A (2)

11. Have the results of your study influenced nursing practice in the military?

Yes (1) No (3) N/A (5)

12. Have the results of your study influenced nursing practice in a setting other than the military?

Yes (2) No (2) N/A (5)

Additional anecdotal comments volunteered by the respondents:

- Reviewers commented on the fact that although the research group was "well seasoned," they were not mentoring military researchers, since the research was to be conducted at nonmilitary facilities. Grantee did not understand that mentoring was a goal of the TSNR Program. Grantee also felt that this requirement was not equally applied to all grant recipients, since a colleague who received a TSNR Program grant for research at a nonmilitary facility did not receive comments on the same issue of mentoring.
- Additionally, the grantee felt the negative comments received from a reviewer regarding a study method that was to be used indicated that the reviewer was not familiar with the theory.
- Six-month progress report is too soon. Just as actual research will begin, a progress report is due.
- The TriService Nursing Research Program should be continued because it focuses on the military nurse, for whom it is difficult to capture funding from other sources.

Appendix B

Questionnaire and Results Summary for Unfunded Applicants

QUESTIONNAIRE TO UNFUNDED TRISERVICE NURSING RESEARCH PROGRAM GRANTEES

ID# _____
Active Duty _____
Reserve _____
Guard _____

INSTRUCTIONS: Please complete each question in the space provided.

Proposal

1. Year of application for proposed research project _____

2. Did you attend a TriService Grants Writing Workshop before you prepared your proposal?

YES NO

3. If yes, did you find the workshop helpful in the development of your proposal? (circle one)

YES NO

4. How could the workshop have improved?

_____

_____

5. After you received the reviewers' comments, did you find them helpful in the development of any subsequent proposal(s)? (circle one)

YES NO

6. Briefly describe how the reviewers' comments could have been improved.

_____

_____

7. Did you resubmit the proposal another year? (circle one)

YES NO

8. Did you submit the proposal elsewhere? (circle one)

YES NO

9. If yes, where did you submit it?

_____

_____

10. If yes, what was the result?

_____

_____

Effects on Career Trajectory

11. Since you applied for a grant from the TriService Nursing Research Program, did you do any of the following? Check all that apply.

___ YES ___ NO Attend a TriService Grants Writing Workshop

___ YES ___ NO Attend research conference(s).

___ YES ___ NO Present at research conference(s).

___ YES ___ NO Request assignment to doctoral/post-doctoral training program. If yes, circle which type of program.

___ YES ___ NO Enroll in doctoral/post-doctoral program.

___ YES ___ NO Other. Please describe. _____

_____

_____

_____

_____

12. What are your thoughts on how your recent experiences with research funding might influence your plans and expectations for the future?

_____
_____

_____
_____

13. Are there factors that significantly influence your productivity and ability to conduct research in your current setting? (circle response)

YES NO

14. If yes, please list these factors.

_____
_____

_____
_____

QUESTIONNAIRE RESULTS NINE UNFUNDED TRISERVICE NURSING RESEARCH PROGRAM GRANT APPLICANTS1

1. Did you attend a TriService Grants Writing Workshop before you prepared your proposal?

Yes (0) No (9)

2. After you received the reviewers' comments, did you find them helpful in the development of any subsequent proposal(s)?

Yes (2) No (7)

3. What did you think of the reviewer's comments?

Comments were:

Good/Helpful (1) Inaccurate/Not relevant (5) Not constructive (3)

4. Did you resubmit the proposal another year?

Yes (2) No (7)

[1] NOTE: Numbers on Questionnaire to Unfunded TriService Nursing Research Program Grantees do not necessarily correspond to numbers on Questionnaire Results Nine Unfunded TriService Nursing Research Program Grant Applicants.

5. Did you submit the proposal elsewhere?

Yes (2) No (7)

6. If yes, where did you submit it?

(a) internally at Duke University Medical Center (was funded).

(b) American Heart Association (pending).

7. Since you applied for a grant from the TriService Nursing Research Program, did you do any of the following? Check all that apply.

Yes	No	
2	7	Attend a TriService Grants Writing Workshop
8	1	Attend research conference(s).
5	4	Present at research conference(s).
2	7[2]	Enroll in doctoral/post-doctoral program.

8. What are your thoughts on how your recent experiences with research funding might influence your plans and expectations for the future?[3]

(a) Sees uphill battle for junior researchers to get funding; sees it getting worse.

(b) Will put forth a more "concentrated effort as research dollars dry up."

(c) Will do the budget of next grant much better.

(d) If feedback were taken to heart, "never would do research again." Wants better reviewers.

(f) Will resubmit outside, but thought it was a good learning experience.

(g) Has serious concerns about the quality of the TSNRP, but will try again in the future.

(h) "Will never go through this again" . . . at least in the military.

9. What are some factors that significantly influence your productivity and ability to conduct research in your current setting?

(a) Workload.

(b) No research assistance, so do one day of research and one day of real work.

(c) Too busy.

(e) Civilian job affects research (reserve).

[2] Out of this seven, four either had a doctorate or were enrolled prior to applying.

[3] Each of the respondents is represented by a letter subheading. Answers were annotated.

(f) Workload makes them do better research. Becoming "lean and mean."

(g) Military gives them a readily available pool of subjects with which to conduct research.

(h) Independence.

(i) Politics; both in military and in medical university.

Additional anecdotal comments volunteered by the respondents:

- The TriService Nursing Research Program needs to get the word out on its Grants Program. Many heard indirectly, by chance.
- The TriService Nursing Research Program needs to also tell applicants about the grant-writing workshops. Many had "no idea."
- If rejected, an applicant should automatically get an application and information on the grants workshop for the next cycle.

Appendix C

Goals for the TriService Nursing Research Program Agreed Upon by the Corps Chief and Directors

(1) The primary goal for the TriService Nursing Research Program is to continue—not only to continue to exist but to continue to grow and improve. The program has made great strides in its brief existence, but considerable potential remains to be tapped. Development of a Strategic Plan for the TriService Nursing Research Program would help to target areas of importance. Continued funding and ongoing resource support are essential to realize this goal.

(2) Another high-priority goal is to identify and eliminate, or at least reduce, existing barriers that currently inhibit nursing research. These may be as simple as unnecessary administrative requirements or artificial constraints imposed on grant applicants; they may be as complex as those that complicate conducting multiservice and multisite studies. The variations among Institutional Review Boards (IRBs), along with site-specific and service-specific requirements, significantly affect the conduct of these studies at more than one site and the participation of multiple services.

(3) A third goal is to forge new and strengthen existing bonds with civilian universities. This academic link creates a bidirectional benefit. There is consultative support for the military which strengthens the research and science, and there is access to study participants and entree to the loving laboratory of military health care delivery systems for the academicians. The inherent reciprocity allows a mutual benefit. The opportunity to delve into meaningful practice questions is enhanced as well. These linkages exist to a modest extent already, but there is much more room to exploit them to the fullest.

Errata

P. 111: the fifth line from the bottom should read "entree to the *living* laboratory of military health care. . . ."

(4) Closely tied to the third goal is the need to develop mere cohesive and collaborative relationships with nurses serving in the various reserve components. There is particular untapped potential for active duty nurses to collaborate with reserve nurses who are faculty nurses at various universities.

(5) Finally, and perhaps most importantly, it is imperative to have an ongoing, predictable level of support for the program. This support includes not only dollars for research but also funds to support the infrastructure of the TriSerivce Nursing Research Program. Paid support staff, especially during the period surrounding the grant process (submission, review, and summary), is essential. A full-time staff would contribute to its effectiveness. These individuals would be able to better track research studies and disseminate findings as well as serve as readily available subject matter experts. The TriService Nursing Research Program could become a Center of Excellence, not only serving as administrators and preliminary approvers of funding, but as a center of expertise, enthusiasm and sharing, helping to spread the word and share their knowledge. The extremely successful but limited Grant Writing workshops serve as an example of such activity. With full-time staff, the positive outcomes could increase many fold.

Appendix D

TriService Nursing Research Program Awards, FY 1992–1995

1992

Davis, Joanne (Navy Active Duty; Naval Hospital, Camp LeJeune, NC). Effects of Diet and Exercise on Blood Panels and Body Composition of the Marine Corps Officer Candidates Population. 1992.

DeRuvo, Sharon (Navy Reserve; George Washington University, Washington, DC). Differentiated Group Professional Practice: Evaluation of a Nursing Care Delivery System. 1992.

Kaman, Deborah (Navy Reserve; George Washington University, Washington, DC). Consumer Use of Information in Selection of Hospitals for Open Heart Surgery. 1992.

Pierce, Penny (Air Force Reserve; University of North Carolina—Chapel Hill). Health and Psychosocial Readjustment of Gulf War Veteran Women. 1992.

Renaud, Michelle (Army Active Duty; Madigan Army Medical Center, Tacoma, WA). The Effects of Modified Care Environment on the Growth and Development of High Risk Infants. 1992.

Turner, Barbara S. (Army Reserve; Duke University Medical Center, Durham, NC). Physiologic Responses to Exogenous Surfactant: Nursing Interventions. 1992.

Turner, Barbara S. (Army Reserve; Duke University Medical Center, Durham, NC). Piglet Tracheal Epithelial Regeneration After Suctioning. 1992.

Young-McCaughan, Stacey (Army Active Duty; Madigan Army Medical Center, Tacoma, WA). Sexual Functioning in Women with Breast Cancer Comparing Women Treated with Systemic Adjuvant Therapy to Women Treated Without Pharmacological Manipulations. 1992.

1993

Abel, Elizabeth (Navy Reserve; University of Texas—Austin). Sexual Risk Behavior of Ship and Shore Based Navy Women. 1993.

Birgenheierm Pamela (Army Active Duty; Madigan Army Medical Center, Tacoma, WA). Effects of Military Parent's Separation on Children. 1993.

Carr, Mary Ann (Army Active Duty; Madigan Army Medical Center, Tacoma, WA). Crisis Intervention with Critical Care Families. 1993.

Condron, Stephanie (Air Force Reserve; Duke University Medical Center, Durham, NC). Cancer Prevention and Early Detection in Military Nurses. 1993.

DeCasares, Elaine (Army Active Duty; DeWitt Army Hospital, Fort Belvoir, VA). Army Women's Breast Cancer Risk. 1993.

DeRuvo, Sharon (Army Active Duty; Tripler Army Medical Center, HI). Differentiated Group Professional Practice. 1993.

Hall, Susan (Air Force Active Duty; David Grant USAF Medical Center, Travis AFB, CA). Impact of Storytelling on Burnout and Nurse Expertise. 1993.

Holder, Margaret (Navy Active Duty; Naval Medical Clinic, Quantico, VA). Evaluation of Selected Health Promotion Programs. 1993.

Johnson, Arthur (Air Force Reserve; University of Texas Health Sciences Center, San Antonio, TX). The Effects of Health Belief Teaching Strategy. 1993.

Leander, Deborah (Army Active Duty; Madigan Army Medical Center, Tacoma, WA). Exogenous Surfactant Therapy in Premature Infants. 1993.

Messecar, Deborah (Army National Guard; Oregon Health Sciences University, Portland, OR). Family Stress Associated with Wartime Separation. 1993.

Mueggenborg, Brenda (Air Force Active Duty; Wilford Hall USAF Medical Center, Lackland AFB, TX). Thrombus Prevention in Tunneled Central Venous Catheters. 1993.

Nelson, Francine (Navy Active Duty; Portsmouth Naval Medical Center, Portsmouth, VA). Reduction of Pain Responses Using Guided Imagery. 1993.

Rea, Ruth (Army Active Duty; Madigan Army Medical Center, Tacoma, WA). Clinical Information Systems: Impact on Nursing. 1993.

Renaud, Michelle (Army Active Duty; Madigan Army Medical Center, Tacoma, WA). Neonatal Outcomes in a Modified NICU Environment. 1993.

Rich, Irene (Army Active Duty; Walter Reed Army Medical Center, Washington, DC). Psychology of Pregnancy: Peace and Wartime. 1993.

Sarnecky, Mary (Army Active Duty; Walter Reed Army Medical Center, Washington, DC). A History of the Army Nurse Corps. 1993.

Slater, Victoria (Air Force Reserve; University of Tennessee, Knoxville, TN). The Effect of Healing Touch on Post-Operative Pain. 1993.

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