

ONLINE EXCLUSIVE

Cancer Nursing Research Short Course: Long-Term Follow-Up of Participants, 1984–1998

Marcia Grant, RN, DNSc, FAAN, Kathleen Mooney, RN, PhD, FAAN, AOCN®,
Dana Rutledge, RN, PhD, Sarah Gerard, and Linda Eaton, RN, MN, AOCN®

Purpose/Objectives: To describe research activities of cancer nurses following participation in the Oncology Nursing Society (ONS)/National Cancer Institute Cancer Nursing Research Short Course from 1984–1989.

Design: Descriptive survey.

Setting: National survey of course participants.

Sample: 128 cancer nurses who attended the courses presented from 1984–1998.

Methods: Mailed survey.

Main Research Variables: Demographic characteristics, current job titles, participation in research since course attendance, sources and amounts of research support, research roles, and publications.

Findings: The course provided new investigators with a unique research experience not available at their own institutions and helped them launch their research careers. The participants' commitment to research is illustrated in their response rate to the survey, record of studies, funding sources, and research roles.

Conclusions: The short course is a valuable resource for increasing the number of committed oncology nursing researchers and assisting in the scientific foundation for the care of patients with cancer. Findings clearly show the value of the course to participants' research careers.

Implications for Nursing: ONS has a commitment to oncology nursing research as the means to increase the scientific foundation for cancer nursing care. The Cancer Nursing Research Short Course provides a valuable resource for meeting this commitment.

Although a small group of nurse scientists has contributed to the scientific foundation of clinical cancer care since the 1980s, a significant gap continues to exist in the research base needed for oncology nursing practice (Mooney, 2000). This gap is related primarily to the lack of a critical mass of clinical researchers able to conduct high-quality, patient-oriented cancer studies. This article describes the long-term follow-up of oncology nurses who attended an annual Cancer Nursing Research Short Course from 1984–1998. Their contribution to oncology nursing research provides evidence of the value of this course and the need to continue to offer it.

Background and Significance

For many years, publications about the United States research enterprise have noted a declining number of healthcare

Key Points . . .

- ▶ Research on prevention and control is needed to improve the quality of life and quality of care for individuals with cancer.
- ▶ Increased numbers of clinical nursing researchers are needed to meet the challenges of conducting behavioral, psychosocial, and supportive care research.
- ▶ The Oncology Nursing Society/National Cancer Institute Cancer Nursing Research Short Course is one of the few opportunities available that supports a scholarly exchange between distinguished oncology nursing faculty and pre- and postdoctoral nursing students.
- ▶ Long-term follow-up of course participants provides evidence of the success of this educational opportunity.

providers, including physicians and nurses, who become clinicians and scientists (DiBona, 1979; Goldstein & Brown, 1997; Kelly, 1985; Kelly & Randolph, 1994; Nathan, 1998; Rosenberg, 1999; Schrier, 1997; Thompson & Moskowitz, 1997; Williams, Wara, & Carbone, 1997; Wyngaarden, 1979, 1986). This decline is occurring simultaneously with the growth of basic science discoveries that require translational, clinical study to bring direct benefit to the public. In addition, to successfully prevent disease and improve quality of life for those experiencing disease, a stronger emphasis is needed on

Marcia Grant, RN, DNSc, FAAN, is a director and research scientist at the City of Hope National Medical Center in Duarte, CA; Kathleen Mooney, RN, PhD, FAAN, AOCN®, is a professor in the College of Nursing at the University of Utah in Salt Lake City; Dana Rutledge, RN, PhD, is a lecturer at California State University in Fullerton; Sarah Gerard is a research assistant at the City of Hope National Medical Center; and Linda Eaton, RN, MN, AOCN®, is a research associate at the Oncology Nursing Society in Pittsburgh, PA. This study was supported by a grant (R25 CA09486) from the National Cancer Institute. (Submitted February 2003. Accepted for publication August 12, 2003.)

Digital Object Identifier: 10.1188/04.ONF.E32-E38

behavioral, psychosocial, and supportive care research. The decline in the number of clinical researchers must be reversed, and the quality and quantity of research that are needed for clinical practice must be improved.

The cancer arena needs more clinical scientists (Mooney, 2000). The Institute of Medicine's National Cancer Policy Board identified quality of life, preventive services, psychosocial support, and symptom management as important components of quality cancer care that require further attention if outcomes of care are to be improved (Institute of Medicine National Research Council, 1999). To prepare high-quality clinical investigators, research training opportunities are needed.

Oncology nurses are a prime healthcare professional group to combine the skills of clinicians and scientists and address the gaps in clinical knowledge. Nurses have the clinical experience to conduct pertinent clinical studies that can provide the knowledge base needed to improve cancer care. To design high-quality studies, nurses, just as other clinicians who wish to conduct research, need research training at the doctoral and postdoctoral levels.

Doctoral education in nursing has grown since the 1960s. Although the first nursing doctorate, an EdD, was offered at Teacher's College, Columbia University, in 1933, only four programs were available by 1960 (McEwen & Bechtel, 2000). Since then, a rapid increase in doctoral programs has occurred with more than 85 institutions offering doctoral education for nurses (Ketefian, Neves, & Gutierrez, 2001). These programs generally are distributed equally across the regions of the United States; however, fewer programs are located in the western states. In addition, 13 states (Alaska, Delaware, Idaho, Maine, Montana, Nevada, New Hampshire, North Dakota, Oklahoma, South Dakota, Vermont, West Virginia, and Wyoming) have no nursing doctoral programs.

With the rapid growth of doctoral programs in nursing, the issue of quality arose. In 1993, the American Association of Colleges of Nursing (AACN) published a consensus document identifying quality indicators for doctoral programs. The recommendations emphasized the essential commitment to a research mission on the part of the parent institution and the nursing unit, the importance of faculty with programs of research that can engage and develop students, and the acquisition of adequate resources to support research activities. Further, AACN recommended that students be selected from a highly qualified pool of applicants where students' research goals are consistent with faculty expertise.

Herein lies the difficulty with preparing nurses with strong research skills in cancer prevention and control research. First, very few doctorally prepared cancer nurse scientists exist. This is compounded by a significant shortage in doctorally prepared faculty overall in schools of nursing throughout the nation (Berlin & Sechrist, 2002). Second, nurses seeking doctoral education and development in cancer research often have difficulty accessing programs that have faculty with experience in cancer research. As the AACN (1993) consensus document on quality indicators suggests, a high-quality program in cancer prevention and control requires a cadre of senior cancer faculty to guide students, faculty with active programs of cancer prevention and control research, and a good fit between student interest and faculty expertise.

When this criterion was applied to the 73 doctoral programs in nursing available in 2000, less than a third were likely to meet AACN's (1993) recommendations. Of the 73 programs,

the National Institutes of Health (NIH) Web site identified only 53 programs with at least one research grant funded by NIH in 1999. In seeking a research-intensive environment for doctoral study, schools would be expected to have several grants; however, only 33 of the 53 schools had more than two NIH-funded research grants in 1999. Based on the membership of the Oncology Nursing Society (ONS) Advanced Nursing Research Special Interest Group and other nurses known to publish research findings regularly in cancer journals, only 21 schools could be identified as research intensive and employing at least one doctorally prepared cancer nursing research faculty member. Thus, a limited number of nursing schools is available to nurses seeking research training at the doctoral level and to doctoral students and new doctoral graduates seeking research mentorship from a cancer nurse scientist. Given the scarcity of oncology nurse researchers in academic settings, supplemental programs are needed to assist doctoral students and new postdoctoral faculty who are developing research programs. The National Cancer Institute (NCI)/ONS Cancer Nursing Research Short Course was developed in the early 1980s to provide this supplemental support to new cancer researchers. This article describes the long-term follow-up of prior course participants and provides evidence of the success of this approach.

Course Description

The overall objective of the NCI/ONS Cancer Nursing Research Short Course is to expand the scientific foundation for nursing care of individuals with cancer. Since 1984, the course has been implemented each spring prior to the annual ONS Congress (with the exception of 1990 when the course was not held). The objectives of the course are to (a) conduct a national forum for exchange between distinguished oncology nursing faculty and competitively selected pre- and postdoctoral nurses from different institutions and (b) use the critique process as an innovative approach to strengthen the scientific nature of competitively selected research proposals.

The idea of sponsoring an ONS pre-Congress short course to encourage and enhance student interest in conducting cancer nursing research was developed at the 1982 fall ONS Research Committee meeting. Four of the committee members developed and submitted a one-year proposal to NCI. Funding was received, the first course was held, and the results were encouraging. The investigators sought additional funding, and the course has been funded since 1984 through competitive renewals submitted to NCI (see Table 1).

Course application information is disseminated through multiple marketing efforts. Information is sent to ONS members with advanced degrees, nurse executives from NCI-designated cancer centers, and schools of nursing with graduate oncology programs. Also, the course is advertised on the ONS Web site and in ONS publications (i.e., *Oncology Nursing Forum*, *Clinical Journal of Oncology Nursing*, and *ONS News*). Applications are invited from doctoral students, postdoctoral individuals, and recent master's program graduates who are interested in conducting research. Five-page abstracts are submitted for proposed studies or studies in progress. Completed research is not accepted.

At least four oncology nursing senior faculty are asked to participate as faculty for the short course. Faculty must be doctorally prepared and hold senior status as oncology faculty

Table 1. Investigators and Codirectors

Dates	Investigators and Codirectors
1982–1996	Marilyn Frank-Stromborg, RN, EdD, JD, ANP, FAAN Professor Northern Illinois University Marcia Grant, RN, DNSc, FAAN Director and research scientist City of Hope National Medical Center Ada Lindsey, RN, PhD, FAAN ^a Dean, College of Nursing University of Nebraska Ruth McCorkle, PhD, FAAN Director and professor Yale University School of Nursing
1997–2002	Marcia Grant, RN, DNSc, FAAN ^a Director and research scientist City of Hope National Medical Center Mel Haberman, RN, PhD Director, Research (until 1998) Oncology Nursing Society Gail Mallory, PhD, RN, CNAA Director, Research (1998–present) Oncology Nursing Society Kathleen Mooney, RN, PhD, FAAN, AOCN® Professor University of Utah Dana Rutledge, RN, PhD Lecturer California State University in Fullerton

^a Principal investigator

in well-established and funded research programs. Abstracts are reviewed blindly by the panel of faculty and codirectors. The top 10 abstracts, plus two alternates, are selected, and individuals are notified of their selection. One month before the course, the participants can submit updated papers of no more than 15 pages of the proposed study to be presented at the course. Two faculty are assigned to review each proposal at the course. At least two weeks prior to the course, a conference call provides for discussion among faculty and codirectors about each proposal and allows the two reviewers assigned to each presentation to share their ideas. This discussion helps to clarify the major problem areas and recommended changes. It also helps to prevent redundancy in the faculty critiques.

On the day of the course, the schedule is very tight. Applicants whose abstracts have been accepted present their proposals after which two of the distinguished faculty review, critique, and discuss the work. The purpose of these critiques is to strengthen the proposals, increasing the likelihood of enhancing the scientific foundation of oncology nursing research. During or immediately following the course, each faculty member submits a one- to two-page summary of the critique that is given to the participant. The written critique is especially valuable for predoctoral students to share with their committee members if their dissertation research is reviewed at end of the short course. Participants evaluate the program at its end with a standard evaluation tool. Six- and 12-month follow-up evaluations are mailed to participants to document their progress on implementation of the research proposals. These evaluations have been consistently positive.

The NCI R25 grant provides financial support to the participants, faculty, and codirectors for travel and per diem. Faculty and codirectors also receive a small honorarium. The cost of the meeting room and refreshments is funded by the grant, as well as part-time secretarial support throughout the year for advertising, distribution of proposals for review, assisting with the agenda, etc. Participants' registration fees for the ONS Congress immediately following the course also are provided by the NCI grant.

Methods

The questionnaire used for long-term follow-up included background information about the participant, current status of the proposal presented during the short course, progress made in relation to publications, information on research funded and completed following the course, current research funding, and general comments. Questionnaires were mailed to participants who attended courses held from 1984–1998. The 1998 cutoff was selected to give time for participants to finish their schooling and move on with their careers. Future follow-up surveys will continue to track participants from 1998. Addresses were obtained from ONS rosters, augmented with information from a variety of active ONS members, previous faculty of the course, and the codirectors.

One hundred thirty-eight positions were available for the course from 1984–1998. During two courses, only nine students attended because participants withdrew too late to substitute an alternate; in addition, no course was held in 1990. Six attendees were not located for follow-up, and another four individuals attended two different courses. Therefore, surveys were mailed to a total of 128 individuals, and 122 responded (95% response rate). Multiple mailings, phone calls, e-mails, and personal contacts were needed for a small portion of the respondents. Analysis subsequently was conducted on 122 individuals; those who attended two courses were counted only once.

Results

The average age of participants at the time of the course and follow-up survey was 39 and 47 years, respectively (see Table 2). The number of years in nursing and oncology illustrates the extensive experience of participants. The vast majority (89%) resides in the United States, 10 reside in Canada, and one participant each resides in Ireland, Nepal, and Taiwan. Those currently residing in foreign countries were usually enrolled in U.S. schools at the time of the course. The geographic distribution of the responders shown in Table 2 indicates where they came from at the time of the course and where they currently reside. They are fairly evenly distributed across the United States with the smallest group in the Southwest and the largest group in the Northeast.

Participants were primarily Caucasian (94%). At the time of the course and the survey, the majority was employed full-time. Ninety-four percent were employed in nursing, and 75% were employed in urban areas.

Education status, current job titles, and research activities were analyzed by dividing the participants into three groups to reflect time since course attendance. Group 1 attended courses from 1984–1988 and consisted of 41 participants. Group 2, with 43 participants, attended courses from 1989–1994. The 38 participants in group 3 attended courses from

Table 2. Participant Demographics

Characteristic	\bar{x}	Median	Range
Age (years)			
Time of course	39	38	27–53
Time of survey	47	47	31–64
Nursing experience (years)			
In nursing	25	24	9–40
In oncology nursing	17	11	2–38
Characteristic	n	%	
Country of residence			
United States	109	89	
Canada	10	8	
Ireland	1	1	
Nepal	1	1	
Taiwan	1	1	
Residence at time of course			
West	23	19	
Midwest	23	19	
Southwest	13	11	
Northeast	36	29	
Southeast	21	17	
Outside United States	6	5	
Residence at time of survey			
West	17	14	
Midwest	22	18	
Southwest	14	12	
Northeast	31	25	
Southeast	25	20	
Outside United States	13	11	
Ethnicity			
African American	3	2	
Asian	2	2	
Caucasian	115	94	
Other	1	1	
Missing	1	1	
Employment			
Full-time	102	83	
Part-time	17	14	
Not employed	2	2	
Missing	1	1	
Current employment			
In nursing	114	94	
Not in nursing	5	4	
Both	2	2	
Missing	1	1	
Employment location			
Urban	92	75	
Suburban	15	12	
Rural	7	6	
Other	6	5	
Missing	2	2	

N = 122

Note. Because of rounding, not all percentages total 100.

1995–1998. The investigators expected that these findings would illustrate completion of doctoral preparation, higher-level faculty positions, and more research activity and funding as time since the course increased.

Data on education level at the time of the course and the survey revealed a large increase in doctoral degree completion following the course (see Figure 1). Reported positions are illustrated in Figure 2. Those from group 1 who had more time

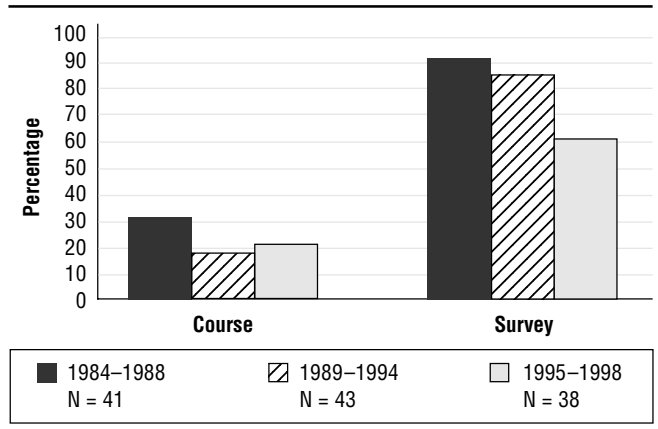


Figure 1. Percentage of Doctorally Prepared Participants at the Time of the Course and the Survey

since the course occupy a large proportion of professor and associate professor positions, whereas those who recently attended the course were primarily at the assistant professor level or in research and education positions.

One of the desired outcomes of the short course was for participants to develop a peer-reviewed funding base for their research program. Focusing on activities that occurred after completion of the course, research support for the three groups was examined in several ways (i.e., the number of participants who had funded research that was either completed or current and the number of grants to the whole group limiting each participant to a maximum of five grants for completed research and five grants for current research). These activities were described in terms of sources for funding, average amount of funding, and principal investigator (PI) role. Publication history provided additional information.

The percentage of individual participants across groups that reported funded research either current or completed is found in Table 3. For completed studies, 76% of group 1, 74% of group 2, and 61% of group 3 received funding. For current studies, 56%, 58%, and 63%, respectively, were funded.

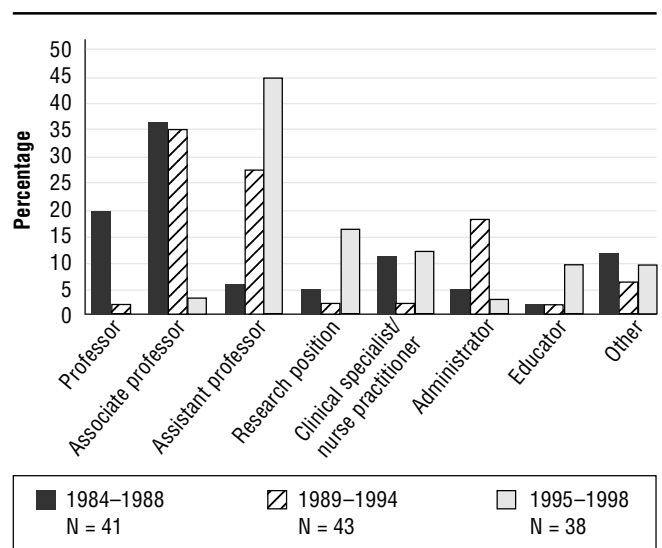


Figure 2. Current Job Title

Table 3. Mean Funding Amount Per Group

Studies	Group 1 1984–1988 N = 41	Group 2 1989–1994 N = 43	Group 3 1995–1998 N = 38
Completed			
Number funded	31	32	23
Percent funded	76	74	61
Mean amount	\$254,513	\$121,077	\$36,578
Range	\$250–\$923,000	\$4,217–\$1,244,658	\$494–\$159,000
Current			
Number funded	23	25	24
Percent funded	56	58	63
Mean amount	\$957,498	\$453,759	\$98,279
Range	\$3,500–\$3,296,381	\$7,000–\$2,361,713	\$7,500–\$634,162

The average amount of support received by participants who were successful in receiving funding also was examined to illustrate patterns among the three groups. For completed studies and current research, the participants with more experience following the short course had higher mean levels of funding than those with less experience. In addition, the increased amount of funding is evident for the three groups in current studies versus completed studies. This was expected because researchers often move from intramural and foundation support for pilot studies to small grants at the national level and then to RO1 level NIH multiyear grants of \$200,000 and more per year.

Funding sources are illustrated in Figures 3 and 4 for completed studies and current grants. Findings illustrate changes as new faculty members establish programs of research. For completed studies, the most common source of funding across groups was foundation support and the most recent course participants had the greatest percentages. The three groups received university or intramural support, and the earlier participants showed the most success in obtaining this type of funding. Federal grants were obtained approximately equally across the three groups. For current grants, differences existed among the three groups: Federal funds were the most frequent source for earlier participants, and university and foundation support were the most frequent sources for the most recent participants.

Participants' responsibilities can be examined by their research title and role. Figure 5 reveals that the earlier participants more frequently reported having a PI role following

completion of the course compared to more recent participants. In addition to being a PI on one's own studies, participation with other researchers also can occur. This is illustrated in the percentage that participated in research but not as PIs. Other roles in research are more common for recent short course participants.

Publication of research is another method of fulfilling the research role expectations. Approximately half of the earlier participants published all or part of the studies resulting from the proposals presented at the short course (see Figure 5). Fewer participants from the later courses published their findings from the course proposal submitted to the short course.

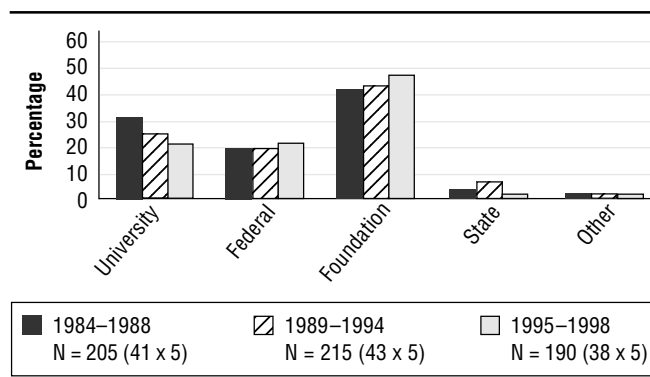
Comments from participants echo the success of the course (see Figure 6). The course acted as a springboard for many by demystifying research, desensitizing participants to the critique process, and sparking enthusiasm for conducting studies. Other participants suggested more time, additional faculty with different expertise, follow-up after the course, and in-depth teaching about research methods. These recommendations would require additional resources and a different focus from the current course format.

Discussion

Determining the success of the short course is important in identifying its value to the continued development of cancer nursing research. This course has provided new investigators with resources not available at their institutions and has been successful in assisting them in launching research programs. Providing new researchers with access to faculty who can critique, advise, and help design appropriate studies will continue to be needed, especially in light of the anticipated shortage of nursing faculty (Berlin & Sechrist, 2002).

The participants of the ONS/NCI Cancer Nursing Research Short Course are mature, experienced in nursing and the specialty of oncology, and 94% Caucasian. Participants' average age when attending the course was 39. This is an older population than that reported by the National Center for Education Statistics (2000) where the average age of those enrolled in 1999–2000 in master's programs across all college programs was 32.6 and across doctoral programs was 33.6.

This survey's findings demonstrate participants' commitment to research in a number of ways. The response rate was outstanding. Participants described the course as a turning point in their research development. They valued the exposure

**Figure 3. Funding Sources for Completed Studies**

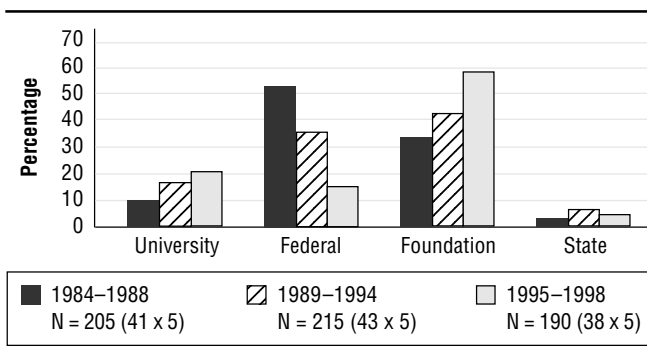


Figure 4. Funding Sources for Current Studies

to the spirit of collegiality, esteemed researchers, funding information, and valuable feedback. Some participants remained in contact with other participants, faculty, and co-directors after the course.

Course participants' employment revealed a pattern of moving toward full and tenured professorship positions as time since the course increased. Most schools require participation in scholarly activities, including research and publication, for advancement to full professorship level. For those participants who attended courses from 1995-1998, none was a full professor, 3% held associate professor positions, and 45% held assistant professor positions. The remaining 52% held a variety of research and teaching positions. In contrast to those participants attending the courses from 1984-1988, 20% held full professor positions and 37% held associate professor positions. This pattern of advanced positions for those further out from the course is as expected.

Respondents were divided into three groups defined by time since taking the course. Participation in research by the three groups was similar. The investigators believe this reflects an increased interest in research and the building of the research foundation for the nursing discipline. Sources of funding for research provide information about the value of foundation support among the participants. Information from completed studies shows that all three groups accessed intramural or university funding, and the earlier course participants accessed this resource more often than groups 2 or 3. In contrast, funding from the federal government was stable across

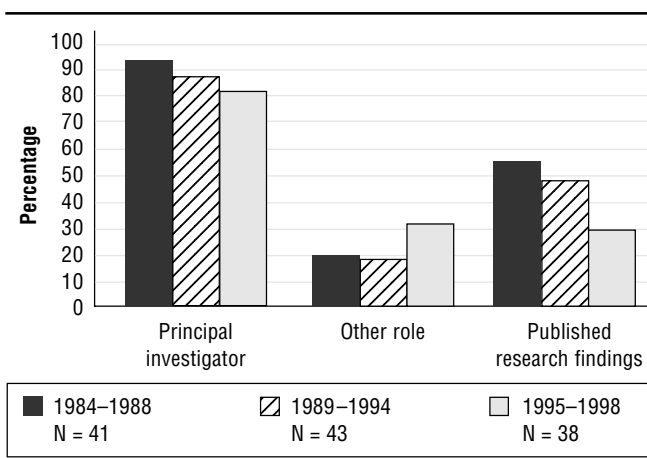


Figure 5. Research Roles and Publication History

the three groups, and support from foundations, although fairly consistent among the three groups, showed the highest percentage for the most recent course participants. The research funding available through the ONS Foundation has increased remarkably in recent years and may help to explain the increase in foundation support for more recent course participants.

When examining the funding sources for current studies, the importance of the federal government for experienced faculty and the use of foundations for the less-experienced participants are evident. Even more dramatic is the information about mean amounts of research funding across the three groups. For completed and current studies, the mean amounts increased as participants gained more experience and the time since the short course increased.

Research involves a variety of roles, with the PI being the independent researcher and leader of the research team. Other roles in the research team may include coinvestigator, data collector, project director, or nurse interventionists (when the study is testing nursing interventions). As expected, participants who are early in their research careers held more alternative research roles, and those with more time and experience were PIs.

A researcher's professional responsibility is to contribute to scientific literature and publish results of studies. This commitment was demonstrated in the survey participants, with a greater percentage of experienced researchers having published the results of the study presented at the short course.

Positive comments

"I found the course extremely beneficial. I have kept the reviewers' comments and read them from time to time when preparing new initiatives. Thank you for the opportunity to attend the course."

"This was a wonderful opportunity that helped me make my 'breakthrough' in funding."

"The ONS/NCI Research Short Course was one of many invaluable opportunities I had during my doctoral education. Having the opportunity to interact with the esteemed nurse researchers that I'd read and studied was something I'll never forget. This socialization opportunity was almost as valuable as the feedback/critique."

"Support for my early attempts at research from ONS were most helpful. I have found the enthusiasm for research and the spirit of collegiality at ONS to be unequalled in the other professional organizations to which I belong."

"This course was extremely helpful. It was a pleasure networking with experienced researchers. The professional contacts have helped me with reference letters and subsequent grant awards. I still keep in contact with several of the participants, and we have been able to support each other in our new research roles."

"Course was excellent entry to scientific community. Helped to launch my career. I love my work and am excited to be where I am now and where our work will go in the future. Science is fun, rewarding, and addictive (at least doing it is)."

Suggestions for improvement

"Take place over two days. Divide/group qualitative and quantitative proposals separately."

"Biostatistical support would be excellent."

"Include a mechanism for immediate follow-up."

"My research project was a qualitative study, and I could have benefited from more in-depth knowledge regarding qualitative methods."

Figure 6. Participant Comments

NCI—National Cancer Institute; ONS—Oncology Nursing Society

This also may demonstrate the length of time needed to complete and analyze the results, write a paper, and have the paper accepted for publication.

In general, the results of the survey are very positive. They reflect what the investigators hoped for—that the ONS/NCI Cancer Nursing Research Short Course is helping to fill the gap in the research base for cancer nursing practice by providing beginning researchers access to expert faculty and helping to increase the critical mass of researchers.

Conclusions

The follow-up evaluation of the participants of the ONS/NCI Cancer Nursing Research Short Course from 1984–1998 reveals the impact of the course on the career development of the participants. Research certainly is a priority in their nursing roles, as illustrated by their current employment, publications, and research support. The value of the NCI/ONS Cancer Nursing Research Short Course is described further by the

participants in their comments about the course. These 122 individuals have begun to address the urgent need to improve the scientific basis for cancer nursing care. As cancer treatment continues to develop through basic science discoveries and applied medical research, nursing research is needed to improve the quality of life for patients with cancer. The focus on behavioral, psychosocial, and supportive care research will require qualified oncology nursing researchers to fill this gap. Future follow-up studies of this group of participants will focus on the analysis of proposals submitted, examining the study questions, populations, methodology, and relationships to ONS-identified research priorities. Although the course may appear to develop only one annual group of participants, the course, setting, and faculty are providing the professional, scientific, and collegial milieu to produce high-quality, productive, and valuable oncology nursing researchers.

Author Contact: Marcia Grant, RN, DNSc, FAAN, can be reached at mgrant@coh.org, with copy to editor at rose_mary@earthlink.net.

References

- American Association of Colleges of Nursing. (1993). *Indicators of quality in doctoral programs in nursing* [Position statement]. Washington, DC: Author.
- Berlin, L.E., & Sechrist, K.R. (2002). The shortage of doctorally prepared nursing faculty: A dire situation. *Nursing Outlook*, 50(2), 50–56.
- DiBona, G.F. (1979). Where comes tomorrow's clinical investigators? *Clinical Research*, 27, 253–256.
- Goldstein, J.L., & Brown, M.S. (1997). The clinical investigator: Bewitched, bothered, and bewildered—but still beloved [Editorial]. *Journal of Clinical Investigation*, 99, 2803–2812.
- Institute of Medicine National Research Council. (1999). *Ensuring quality cancer care*. Washington, DC: National Academy Press.
- Kelly, W.N. (1985). Personnel needed for clinical research: Role of the clinical investigator. *Clinical Research*, 33, 100–104.
- Kelly, W.N., & Randolph, M.A. (Eds.). (1994). *Careers in clinical research*. Washington, DC: National Academy Press.
- Ketefian, S., Neves, E., & Gutierrez, M. (2001, May 31). Nursing doctoral education in the Americas. *Online Journal of Issues in Nursing*, 5(2). Retrieved October 31, 2003, from http://www.nursingworld.org/ojin/topic12/tpc12_8.htm
- McEwen, M., & Bechtel, G.A. (2000). Characteristics of nursing doctoral programs in the United States. *Journal of Professional Nursing*, 16, 282–292.
- Mooney, K.H. (2000). Oncology nursing education: Opportunities in the new century. *Seminars in Oncology Nursing*, 16, 25–34.
- Nathan, D.G. (1998). Clinical research: Perceptions, reality, and proposed solutions. National Institutes of Health Director's Panel on Clinical Research. *JAMA*, 280, 1427–1431.
- National Center for Education Statistics. (2000). National postsecondary student aid study. Retrieved February 19, 2004, from <http://nces.ed.gov/surveys/npsas>
- Rosenberg, L.E. (1999). Physician-scientists—Endangered and essential. *Science*, 283, 331–332.
- Schrier, R.W. (1997). Ensuring the survival of the clinician-scientist. *Academic Medicine*, 72, 589–594.
- Thompson, J.N., & Moskowitz, J. (1997). Preventing the extinction of the clinical research ecosystem. *JAMA*, 278, 241–245.
- Williams, G.H., Wara, D.W., & Carbone, P. (1997). Funding for patient-oriented research: Critical strain on a fundamental linchpin. *JAMA*, 278, 227–231.
- Wyngaarden, J.B. (1979). The clinical investigator as an endangered species. *New England Journal of Medicine*, 301, 1234–1259.
- Wyngaarden, J.B. (1986). The priority of patient-oriented research. *Clinical Research*, 33, 95–104.

For more information . . .

- ONS Web site: Research Short Course
www.ons.org/xp6/ONS/Research.xml

Link can be found at www.ons.org.