Mentoring advanced practice nurses in research: Recommendations from a pilot program

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Abstract

Advanced Practice Nurses (APNs) need research skills to develop and advance their practice and, yet, many have limited access to research training and support following completion of their advanced degree. In this paper we report on the development, delivery, and evaluation of an innovative pilot program that combined research training and one-to-one mentorship for nine APNs in conducting research relevant to their practice. The program was organized within an academic institution and its affiliated hospitals in Toronto, Canada. Our experience with this program may assist those in other organizations to plan and deliver a similar program for APN research mentorship.

Key words: advanced nursing practice, mentorship, research training

Background

The role of Advanced Practice Nurses (APNs) is to manage the care of complex and vulnerable populations, educate and support interdisciplinary staff, and facilitate change and innovation within health care systems (Lewandowski & Adamle, 2009). According to the Canadian Nurses Association (CNA), "generating, synthesizing, and using research evidence is central to advanced nursing practice"

(2008, p. 23). Not only are APNs expected to identify and implement research-based innovations to improve client care, but act as a primary investigator or collaborator to conduct research to enhance or benefit nursing practice (CNA, 2008). The minimum education preparation for an APN is a graduate degree in nursing (CNA, 2008), but this education may not provide nurses with adequate time or experience to develop the necessary skills and confidence to conduct research. Anecdotal evidence of APNs in practice indicates that opportunities and support (i.e., coaching, supervision, protected time, and funding) to conduct research or learn to present and publish their work varies. "The Oncology/Supportive Care Research Mentorship Program" was established to provide mentorship and research training, within an academic institution and its affiliated hospitals, to enable APNs in oncology or supportive care to carry out a piece of research relevant to their practice. In this paper we report on the development, delivery, and evaluation of this innovative nine-month pilot program, as well as share recommendations for future programs.

Program development

The program took place within an academic institution for undergraduate and graduate nursing studies in Toronto, Canada. The academic institution and its affiliated teaching hospitals form a network dedicated to providing high-quality patient care, conducting research, providing education, and supporting knowledge transfer. Within this network, members sought to enact their role in this mission by providing education and support to APNs in oncology and supportive care to conduct clinically based research. The focus was on APNs to enhance their research skills to impact patient care, and act as role models for other nurses and health professionals in the conduct of future research. APNs were assumed to possess some research knowledge from their clinical or program focused areas. Faculty members sought to build on the APNs' current knowledge and experience and develop supportive relationships amongst APNs in conducting research. A key strategy in the development and delivery of the program was to engage nurse leaders in the teaching hospitals to embrace the program as a crucial initiative to enable APNs to fulfil the research expectations of their roles. "The Oncology/Supportive Care Research Mentorship Program" was developed following a similar program in the United Kingdom, from the capacity building activities of a supportive and palliative care research collaborative (Bailey et al., 2006). The academic institution provided funding for the program, in partnership with four of its affiliated teaching hospitals.

The program consisted of three main components: academic support, research training, and mentorship. Academic support included resources of the nursing faculty, access to the academic library and its services, office cubicle space with a computer, printer, and phone, use of meeting rooms, and information technology support (i.e., an intranet-based discussion forum and links to videotaped research training sessions). APNs who took part in the program were given protected time away from their clinical responsibilities in each partner hospital. In addition, partner hospitals used internal resources or small grants of up to \$10,000 to support APNs in conducting their research and/or disseminating their research findings. The research training component of the program was developed after APNs were accepted into the program so it could be tailored to the group's needs. The training component will be discussed in detail later in this paper.

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Mentorship

The core component of the program was mentorship. Mentoring is defined as “a voluntary, mutual, beneficial, long-term relationship in which an experienced and knowledgeable leader (the mentor) supports the maturation of a less experienced nurse with leadership potential (the mentee)” (CNA, 2008, p. 41). Traditional mentoring refers to mentors matched to mentees to guide and assist them to learn skills in their clinical environment (Ali & Panther, 2008). Mentoring has been successfully used to recruit and retain new nurses (Block, Claffey, Korow, & McCaffrey, 2005; Funderburk, 2008; Grossman, 2009), to enhance job satisfaction (Funderburk, 2008), and to develop leadership skills (Evans & Reiser, 2004). However, very few studies have explored the process of research mentorship (Bettman, 2009).

Two senior scientists provided initial direction and support to each APN to identify a feasible research project and research deliverables within the program timelines. Two senior doctoral nursing candidates were hired to provide one-to-one mentorship to APNs during the nine-month program. Each APN was matched to one mentor based on the methodological approach used in their project (quantitative versus qualitative). The two senior scientists continued to support the mentor-mentee pairs through regular consultation by email, teleconference, or in person to ensure mentees were making progress towards their project deliverables. While both PhD candidates were well into their own research and had several years of nursing and research experience prior to entering their PhD program, the research mentor role was relatively new to them. The combination of a senior scientist with a doctoral candidate together formed the “mentorship component” of the program. However, the doctoral candidates took the lead role as mentors.

Initially, the program was envisioned to occur over six months with at least two days of protected time for research. However, many of the APNs found it difficult to have more than one day a week of protected time. The program ran for about nine months from the time the two doctoral candidates were hired until the final education session was held. Ongoing support was offered by the senior scientists to the APNs after the conclusion of the formal program, inviting access to mentors as needed to complete the APN’s research projects.

Recruitment of APNs

Nurse executives at participating hospitals encouraged interested APNs in oncology/supportive care to apply to the mentorship program. Applicants submitted a research project proposal, their curriculum vitae, letters of support from nursing executives, and a commitment from both nurse leaders and physician collaborators to allocate one day a week off-site to the mentorship program. Applications were reviewed by an awards committee. Ten APNs were accepted into the program. However, one APN withdrew due to a change in employment. There were two groups of

two APNs who worked together on projects and shared the scholarship. Therefore, nine APNs worked on seven projects and all completed the program. All worked in large urban hospitals in various areas of oncology practice including health promotion, treatment, and follow-up care. Demographic information about the APNs and their research experience prior to beginning the program is provided in Table 1.

Learning needs assessment

One of the underlying principles of the program was to tailor the three components of the program (i.e., academic support, research training, and mentorship) to meet the individual learning needs of each mentee as much as possible. Thus, the mentees met with the senior scientists individually to discuss needs and goals and were asked to complete a self-assessment of their research experience. The self-assessment, called the “Research Spider,” was used to assess research experience. The Research Spider has significant face and construct validity, as well as excellent test re-test reliability of the experience score (Smith, Wright, Morgan, & Dunleavy, 2002). Mentees rated their research experience (from 1=no experience to 5=very experienced) in 10 discrete components of the research process: generating research ideas, critical review of literature, finding relevant literature, using qualitative methods, using quantitative methods, writing research proposals, applying for funding, analyzing and interpreting results, writing/presenting research reports, and publishing research. Figure 1 presents each mentee’s mean score across all 10 aspects of the research process as assessed prior

Figure 1. Mentees’ average self-rating of research experience before and after the program

Experience scores (from 0 to 5) obtained with the “Research Spider” (Smith, et al., 2002), averaged across all 10 components of the research process for each of the nine mentees before and after taking part in the mentorship program.

Note: The 10 components of the research process were:

1. finding relevant literature
2. generating research ideas
3. critical review of literature
4. writing research proposals
5. applying for funding
6. using quantitative methods
7. using qualitative methods
8. analyzing & interpreting results
9. writing/presenting research reports
10. publishing research

Number female	9
Mean years in oncology/supportive care	12.7
Number with a thesis-based masters degree	1
Number with experience managing or leading research projects	2
Number with a first author publication	1
Number with a least one co-author publication	3

to taking part in the program and at the end of the final education session. Ongoing informal assessments during one-to-one mentorship sessions allowed further tailoring of the program components to fit APNs' learning styles and needs.

Research training sessions

Research training sessions were developed based on the APN's self-reported research experience assessed through the spider diagrams, as well as the types of research projects being conducted. Since there was great variation in needs and projects, the training sessions were designed to enhance skills in all areas of the research process. APNs were encouraged to bring questions from their own projects to these sessions so they could learn from each other's experience and receive guidance from the person presenting the session. Since half of the APN group was working towards publishing their work, the first session addressed writing to successfully

publish in peer-reviewed health care journals. The remaining sessions followed the systematic steps of the research process. There were 11 sessions held through the course of the program. Session topics are provided in Table 2.

Program delivery

The mentors were available at the academic institution on one designated day each week to provide consultation and support, as needed, to mentees. Additionally, mentors scheduled twice monthly more formal meetings with mentees to review their progress, provide feedback, and assist in the conduct of the mentees' projects. The mentees met with senior scientists at the beginning, middle, and end of the program, and more often, as needed.

Research training sessions were two hours long and presented by one of the senior scientists, one of the mentors, or a member of the nursing faculty. Sessions occurred twice monthly alternating on either a Tuesday or Wednesday to allow the greatest number of mentees to attend each session. Pre-readings and handouts were made available through email to all attendees prior to each session. Each training session was videotaped and available to all mentees through an intranet link so the session could be viewed at their convenience if they were unable to attend or if they wished to review it. There was opportunity for additional discussion between sessions through a discussion board on the intranet. After each session, mentees were encouraged to evaluate the session through an anonymous web-based survey created for the program.

Conclusion of program

At the end of the program, each mentee (or pair) presented a 20-minute synopsis of their research project and their experience in the program to the entire group of mentees, mentors, and senior scientists. This final session offered mentees the opportunity to present their work, respond to questions, and receive feedback in a supportive small group environment. A few months later, mentees gave a similar presentation to a wider audience of nursing executives from all partnering institutions, as a final dissemination day. During this day, nursing executives were invited to discuss the program's strengths and ways to improve the program.

The research projects

There was great variation in the types of projects conducted by APNs in the program with all phases of the research process

Session	Topics
1.	Writing for Publication
2.	An Introduction to Research Paradigms
3.	Approaches to Reviewing the Literature
4.	Data Collection Strategies in Qualitative Research
5.	Data Analysis in Qualitative Research
6.	Quantitative Research Designs and Sampling
7.	Data Collection, Measurement, and Instruments in Quantitative Research
8.	Data Analysis in Quantitative Research
9.	Research Ethics
10.	Knowledge Transfer and Exchange
11.	Writing Grant Proposals

APNs	Project topic	Proposal submitted for funding or ethics review	Abstract submitted for conference presentation	Manuscript submitted for publication
1	Development, delivery, and evaluation of an out-patient health promotion program for breast cancer survivors		1	1
2 & 3	Experiences of gynaecological cancer patients and their families during transitions from hospital to home		1	1
4	Experiences of cancer patients recovering from laryngectomies			1
5	Experiences of patients with oral and laryngeal cancer receiving radiation treatment		1	2
6	Assessment of the feasibility and effectiveness of a sleep hygiene and relaxation intervention in children with cancer	1	1	
7 & 8	Patient validation of a malignant wound assessment tool	1	1	
9	Impact of rapid diagnostic assessment vs. standard care on psychosocial outcomes for women undergoing testing for breast cancer	1	1	

represented. The topic area of each mentees' research project and outcomes are summarized in Table 3. Half of the group worked on completing data analysis and writing manuscripts for existing research projects, while the other half of the group worked on the development of new research projects.

Program impact

The "Research Spider" (Smith et al., 2002) was completed by all mentees prior to beginning the program and at the end of the last education session. There was an average increase of 0.91 (range 0.1 to 1.8) in the mentees' average scores from the beginning to the end of the program (see Figure 1), indicating the mentees felt their knowledge and experience in research had increased during the course of the program. There was a trend in participants who had the lowest scores prior to the program and who participated the most (i.e., based on attendance in sessions and in meetings with mentors) to report the greatest improvement post program in each area assessed.

The APNs actively promoted evidence-based practice through sharing findings of their research projects through formal and informal venues. More specifically, their research activities led to the preparation of five papers for publication in peer-reviewed nursing journals (most now submitted for publication or accepted) and submission of six abstracts for national and international conference presentations. The APNs also shared their findings (from their project or from literature reviews) or details of their proposed studies with colleagues in their clinical areas.

In addition, indirect benefits from the program were realized. One mentee's research project included development, delivery, and evaluation of a health promotion program. Based on evidence of the program's feasibility and successful outcomes, a team from another hospital agreed to partner to expand the health promotion program. Other indirect benefits, which were informally expressed by APNs, were improved leadership skills and increased collaboration and consultation with clients and others on their health care team. Likewise, the mentors expressed that the experience provided opportunities to apply their own research experience and skills to different settings or populations. As well, the mentors gained experience in program development and evaluation, teaching, and mentoring with the support of the senior scientists.

Evaluation of the program

APNs were asked to complete an online evaluation of each training session within one week of attending the session. At the end of the program, APNs were asked to evaluate the program, as a whole, again through an online survey. APNs were asked to indicate on a 5-point Likert scale ranging from "strong agreement" to "strong disagreement" whether: a) session objectives were met, b) the session was interesting and relevant, c) the knowledge gained had utility in current or future research, d) they planned to share information with colleagues, e) readings were helpful, f) the instructor was knowledgeable, well-prepared, and motivated learning, and g) they were satisfied with the session. Despite two reminders to complete individual evaluations for each session, on average, only four APNs (range two to eight) did so. Generally only half of the APN group attended each training session in person while the remainder watched the video tape in the days or weeks following the session. It is possible the low response rate for the evaluations was due to APNs only evaluating the sessions that they attended in person. For the APNs that did complete the evaluations, there was "agreement" or "strong agreement" in each area assessed for each training session.

Evaluations of the overall program were completed by seven of the nine APNs at the end of the last education session. All seven APNs reported agreement or strong agreement that their research training needs were met. While 71.4% (n=5) reported that they were

"completely satisfied" with the mentorship program, the remaining 28.6% (n=2) reported they were "mostly satisfied." All of the mentees reported strong agreement that their mentors were easily accessible, provided timely feedback, were knowledgeable about research, and motivated them to continue with their research projects. Similarly, 86% (n=6) of mentees reported strong agreement or agreement that supervising senior scientists were knowledgeable about research, were accessible, provided timely feedback and motivated them to continue with their research projects. All of the mentees reported they would recommend this program be offered again in the future; although one commented that they would do so if there was "more realistic expectations" given the nine-month timeframe. One APN recommended a session be added to discuss research strategies with challenging populations.

The majority of mentees attended or watched the video of each of the research training sessions and made consistent use of the office space available at the academic institution. However, a few found it more difficult to be excused from their clinical duties to use the space and attend formal training sessions in person. One mentee stated, "[Although the] fall was easier to ensure two days a week at (the name of institution), the winter was only one day a week due to increased work demands, which could not have been prevented or altered."

In response to questions of whether mentees met their individual goals, 28.6% (n=2) responded that they had met their goals, while 71.4% (n=5) responded that they had partially met their goals. Mentees were asked to comment on what prevented them from meeting their goals and what additional supports or aspects would have helped to meet their goals. Their comments primarily reflected mismatched expectations between time for their research project, work demands, and unexpected personal leave or absences for illness. One mentee stated, "Having the facility space and access to our mentors were the two key factors that assisted in meeting my goals."

Limitations

There were some limitations to the pilot program described and evaluated. The program was relatively small, providing support to nine APNs conducting seven projects. Not all APNs were able to attend all training sessions in-person; sometimes leading to a low response rate for the session evaluations. The APNs were not followed beyond the end of the program in any formal way to assess long-term program impact. In addition, the direct and indirect costs of the program were not specifically tracked. Some APNs who took part in the program focused on completing existing projects rather than developing and completing a new project for the program. While the program was initially conceptualized as supporting new projects, these APNs received protected time, additional knowledge, and mentorship to successfully complete their projects and begin thinking about how to design the next project. Those who did start new projects were not able to complete them during the timeframe of the program, although they were able to get to the point of ethics approval and some ongoing support for their projects continues to be provided by the senior scientists. Despite these limitations, we believe our program was successful based on the outcomes described above and presented in Table 3.

Future recommendations

Based on the above limitations, APNs' online evaluations of the program and formal discussions among mentors, senior scientists and the sponsoring nurse executives from each participating hospital, key features of the program, as well as suggested changes are recommended to guide development of similar programs in the future.

1. Protected time for the APNs (i.e., at least one day a week) to engage in research activities was crucial to the program and, at times, difficult to achieve.

2. Mentors with sufficient research knowledge and experience who also have protected time specifically for providing support to the APNs were a crucial component of the program. The two senior scientists also needed protected time to be able to support the program. The mentorship role could be filled by senior doctoral candidates, postdoctoral fellows, or faculty members. In our program, senior scientists provided additional support to the mentor-mentee relationship. This additional level of support added some accountability to assist the APNs to meet their goals in a timely manner and a second opinion if the mentor or APN needed additional information or feedback about any aspect of the projects. The use of doctoral candidates as the "front-line" mentors enabled effective use of the senior scientists' time and contributed to timely responses to concerns or questions from the APNs. The two layers of support initially created some confusion for the APNs in terms of who should be contacted for questions. It would be helpful to clearly lay out the roles and responsibilities at the beginning of the program, although it was also important to negotiate the mentor-mentee relationship to best meet the needs and style of the individual APNs taking part in the program.
3. It may be helpful to provide the APNs with access to other senior scientists or faculty with specific content or methodological expertise. These other scientists may be those unable to commit to ongoing mentorship, but who could provide consultation on specific issues. This type of consultation occurred for some APNs informally during training sessions, and may have been a helpful addition as a formal component of the program.
4. We suggest offering the program in future over at least one year. This longer timeframe may be more appropriate to conduct and complete a research project.
5. We recommend the training sessions be provided as a concentrated week-long workshop at the beginning of the program, a concentrated two or three days at the midpoint, and then a final presentation day at the end of the program. In the evaluations, mentees indicated that sessions were not always delivered to meet their needs in a timely manner. For example, the session on ethics was not done until quite late in the program and three projects involved developing proposals for ethics review. Additionally, mentees expressed that taking time away from their clinical settings for a week-long training workshop would have been more feasible than one day every other week to attend the sessions. Greater in-person participation in the training sessions may also assist with response rates for the evaluation component of the program.

The support of the mentors and senior scientists and availability of office space on a weekly basis would still be crucial to assisting the mentees to make progress on their projects between the concentrated training sessions.

6. Future programs should include a component to track all associated costs including materials and time.
7. A program manual may be a helpful addition to more clearly lay out expectations, roles and responsibilities, and additional resources and readings at the beginning of the program.
8. Follow-up with APNs to assess the number and types of research activities conducted in the years after completion of the program would be beneficial to determine the long-term effectiveness and impact of the program.

Conclusion

APNs may have difficulty meeting the research expectations of their role, not due to a gap in knowledge from their education, but due to limited time, opportunities, and support to conduct research projects. This research mentorship program represents an innovative intervention combining research training, academic support, and one-to-one mentorship to develop and advance APNs' research practice within an academic institution and its affiliated hospitals. While the program was only nine months, it gave mentees an opportunity to enhance and apply their research skills, influence practice, and improve patient care. While this program was provided only to APNs in oncology and supportive care, the program has the potential to benefit APNs in other specialties interested in conducting research relevant to their clinical practice.

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