Environmental Health Competencies: A Survey of U.S. Nurse Practitioner Programs

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ABSTRACT

Because of widespread public and governmental concern about the health effects of environmental hazards and exposure in recent years, and the increasing incidence of environmentally-induced diseases, it is important that primary care nurse practitioners possess the knowledge and skills to effectively address environmental health as a component of their practice. A mailed questionnaire survey of 187 U.S. nurse practitioner (NP) programs was conducted, with a response rate of 64%, to determine: 1) current and ideal emphasis on environmental health, 2) faculty preparation for teaching environmental health, 3) environmental health competencies expected of graduates, 4) didactic and clinical contact hours devoted to environmental health, and 5) barriers and incentives to greater emphasis on environmental health. Findings reveal that more than two-thirds of NP program directors believe there should be greater emphasis on environmental health in their programs, but expressed concerns about overcrowded curricula and lack of faculty preparation as barriers to change. Competencies with the highest mean ratings included understanding the relationship between environmental hazards and human health, accessing information resources related to environmental hazards and health, and counseling clients about how they can reduce risks associated with environmental hazards. The two factors identified as most likely to increase the emphasis on environmental health in NP programs were having nurse faculty with expertise and being able to access information resources related to environmental health. Currently, insufficient attention is given to environmental health in nurse practitioner education programs.

Throughout its history, nursing has been concerned with the impact of the environment on human health. Florence Nightingale (1859) was a pioneer in emphasizing the importance of such environmental influences as clean air, pure water, light, and sanitation in restoring health and reducing the incidence of disease. Since Nightingale's time, industrialization and technological advances, especially those in the twentieth century, have brought about changes in the environment and altered human-environment interaction, and in so doing, created numerous environmental hazards.

The importance of the environment to human health cannot be overstated. Environment, along with age and heredity, is one of the primary determinants of health. The Surgeon General's report (U.S. Department of Health and Human Services, 1979) estimates that 20% of deaths in the United States can be attributed to such factors as pollution and toxic chemicals in the environment, a figure that may be rising. Although historically, vector-borne illnesses and contaminated food and water supplies resulting from improper storage or sewage treatment were the major sources of environmentally-induced disease, concerns today focus on the toxic effects of spent fuels, industrial chemicals, and hazardous wastes (Shugars, O'Neil, & Bader, 1991; U.S. Department of Health and Human Services, 1992; Worthington & Cary, 1993). A number of environmental hazards have been linked to both acute and chronic diseases in our society. For instance, exposure to lead, such airborne pollutants as asbestos, radon, carbon monoxide, ozone, and tobacco smoke, and contaminated water, contribute to the high incidence of lung disease, cancer, and chronic disability in the U.S. population.

Nurses who provide primary health care services are well positioned to help ameliorate the adverse impact of such hazards on the health of individuals and communities. Given the potentially deleterious effects of environ-
mental hazards on health, and the fact that many environmental health risks are both identifiable and preventable, nurses in advanced practice roles, specifically primary care nurse practitioners, must be prepared to address environmental health as a component of their practice. Such activities as risk reduction; early detection and treatment of, or referral for, environmentally-induced disease; and client education about environmental hazards are well within the scope of primary care nursing practice.

**Recommended Environmental Health Competencies**

Worthington and Cary (1983) urge nurses to increase their awareness of environmental risks and issues. Specifically, they call for nurses to acquire the knowledge and skills to recognize and treat environmentally-induced disease, become advocates for environmental issues to protect patients' health, conduct environmental assessments, work with employers and communities to reduce risk and prevent exposure to environmental hazards, promote healthy behaviors and lifestyles, and identify resources for accomplishing the above. Mancino (1986) recommends that all nurses acquire at least a basic knowledge of environmental hazards and their threat to human health, and that some seek advanced preparation in the areas of environmental and occupational health. She also urges more nurses to get involved in environmental public policy through elected office or career appointments in government.

These positions are echoed by the American Association of Colleges of Nursing (1993), which recommends that content related to environmental and occupational health be incorporated into professional nursing programs to prepare nurses to effectively address health problems that emanate from environmental causes and help reduce the risk of environmentally-induced disease in individuals and communities. Recently, the National Institutes of Health issued a request for proposals for predoctoral and postdoctoral fellowships for nurses to gain additional training in the environmental sciences.

The Pew Health Professions Commission (Shugars, O'Neil, & Bader, 1991) points out that twentieth century progress has precipitated "countless environmental problems" that contribute to chronic disease and ill health. Yet, as Rosenstock (1992) notes, the current health care system is not adequately prepared to respond effectively to the growing need for environmental and occupational health services. The Commission has charged the nation's health professions schools with ensuring that health practitioners are prepared to respond to changing public health needs, including those related to the environment. Specifically, the Commission recommends that future health professionals acquire the ability to "assess, prevent and mitigate the impact of environmental hazards on the health of the population" (Shugars, O'Neil, & Bader, 1991).

In a reformed health care system with its anticipated focus on primary and community-based care and care of aggregate populations, environmental health will become an increasingly important area of emphasis. Future health practitioners will be expected to have sufficient knowledge and skills to be able to prevent, diagnose, and treat environmentally-induced diseases, educate the public about environmental risks, and address environmental policy issues in their communities.

Currently, it is not known to what extent nurse practitioner programs provide didactic and clinical learning experiences related to environmental health, or what environmental health competencies nurse practitioner program graduates are expected to exhibit. Because of widespread public and governmental concern about the health effects of environmental hazards and exposure in recent years, it is imperative that nurse practitioner programs prepare graduates with the competencies that are needed to respond effectively to environmental health issues and problems of individuals and communities.

The purpose of this study was to ascertain the extent to which nurse practitioner programs in the United States are addressing environmental health in their curricula. Specifically, the study was conducted to determine: 1) the current and ideal degree of emphasis on environmental health in U.S. nurse practitioner programs, 2) faculty preparation for teaching environmental health, 3) environmental health competencies expected of program graduates, 4) didactic and clinical contact hours devoted specifically to environmental health, and 5) barriers and incentives to greater emphasis on environmental health.

**Method**

**Sample**

The study sample included all U.S. nurse practitioner program directors who are members of the National Organization of Nurse Practitioner Faculties (NONPF) (n=187). Mailing labels were obtained from NONPF, whose immediate past-president indicated the project was of value to the organization (Zimmer, personal communication, 1993).

The first mailing yielded a response from only one quarter of the sample (n=47). A second mailing was sent three weeks after the initial mailing to the 130 program directors who had not responded, resulting in an additional 73 completed surveys, for a total survey response rate of 64% (n=120). However, only 90 questionnaires, or 48% of the original sample, were considered valid for inclusion in the final data analysis. The remaining respondents returned but did not complete, or only partially completed, the questionnaire. The majority of these respondents were directors of such programs as neonatal or acute care nurse practitioner programs who indicated that the topic of environmental health was not viewed as directly relevant to their programs.
Instrument

An 18-item questionnaire was developed by the research team and pilot tested with two nurse practitioner program directors in the researchers’ own institution. The survey instrument was then packaged using the Total Design Method (Dillman, 1978), a technique which employs a booklet format in a color and size designed to attract the attention of prospective respondents. The questionnaire was accompanied by a cover letter. To return the completed questionnaire, respondents had only to fold, staple, and mail the booklet. Return postage was guaranteed.

A forced choice format was used for each of the 18 questions, with a section for comments included at the end of the questionnaire. The first set of questions contained five items. Two asked respondents to indicate how much emphasis (no emphasis to a great deal of emphasis) is currently placed on environmental health in their program, and how much emphasis ideally should be placed on the topic. The other three items asked to what extent (1=not at all, 5=to a great extent) each competency is expected of their program’s graduates. The nine competency statements were derived from those recommended in the literature (Institute of Medicine, 1988; Mancino, 1985; Shugars, O’Neil, & Bader, 1991; Worthington & Cary, 1993).

Respondents were next asked to estimate the total number of classroom/seminar and clinical/field experience hours devoted specifically to environmental health in their program, with fixed choice response options provided. The final two questions, respectively, asked program directors to select the primary reason nurse practitioner programs may place less emphasis on environmental health relative to other topics, and factors that would be likely to increase the emphasis on environmental health in their program.

Findings

Responses to questions about actual and ideal environmental health emphasis in respondents’ nurse practitioner programs are summarized in Figure 1. Three-fifths of respondents indicated that minimal (58%, n=52) or no (2%, n=2) emphasis is placed currently on environmental health in their program, while 37% (n=33) said the topic is given moderate emphasis. Only 3% (n=3) replied that environmental health is emphasized a great deal in their program. Almost four-fifths believed that, ideally, the topic should be given moderate (70%, n=63) or
a great deal of (9%, n=8) emphasis; the remaining 21% (n=19) stated it should be given only minimal emphasis. None of the respondents said the topic should be given no emphasis.

Figure 2 summarizes respondents' perceptions of faculty willingness to modify the curriculum to include environmental health content and learning experiences. Nearly half (49%, n=42) of the respondents gave a neutral response, reflecting uncertainty about where nurse practitioner program faculty stand on this issue. Overall mean response to this item was 2.93 (mode=3), indicating that faculty are slightly less willing than more willing to change the curriculum to accommodate the topic of environmental health. Only 3% (n=3) indicated a belief that faculty are willing to modify the curriculum to a great extent, whereas 6% (n=5) viewed faculty as not at all willing to do so.

Figure 3 presents responses to questions that asked how well nurse practitioner program faculty are prepared to teach content or provide clinical supervision with a specific focus on environmental health. In general, faculty are not perceived by program directors as adequately prepared to teach environmental health content (mode=2; mean=2.66 [SD=.94]). Only one-fifth of respondents (n=19) selected 4 or 5 on the 5-point scale (1=not at all, 5=to a great extent), while slightly more than half (n=46) chose 1 or 2. Faculty also are not perceived as adequately prepared to provide effective clinical supervision and role modeling related to environmental health (mode=2; mean=2.67 [SD=1.02]). Slightly more than half (n=47) chose 1 or 2, whereas fewer than one-quarter (n=22) selected 4 or 5 on the 5-point scale.

**Expected Environmental Health Competencies**

Responses to items designed to ascertain the degree to which nine competencies in environmental health are expected of graduates of the nation's nurse practitioner programs are presented in Table 1. Mean ratings ranged from a high of 3.39 to a low of 2.45 (5=to a great extent, 1=not at all). Competencies with the highest mean ratings included understanding the relationship between environmental hazards and human health (mean=3.39), accessing information resources related to environmental hazards and health (mean=3.21), and counseling clients about how they can reduce risks associated with environmental hazards (mean=3.08). Providing information to community groups about local environmental risks and exercising direct influence on environmental public policy had the lowest mean ratings, 2.45 and 2.53, respectively. The competency with the highest modal rating was accessing information resources related to environmental hazards (mode=4). All other competencies had modal ratings of 2 (n=3) or 3 (n=5).
Dedicated Learning Time in Environmental Health

Over three-fifths (62%, n=56) of respondents indicated that four or less hours of classroom or seminar contact hours are devoted specifically to environmental health in their program (Figure 4). Only four directors (4%) said their program includes more than 12 classroom or seminar hours of content on environmental health, while five (6%) indicated that no classroom or seminar hours are devoted specifically to this content. The mean number of classroom or seminar hours for the entire sample was 2 to 4 hours; the modal response was less than 2 hours.

Table 1

<table>
<thead>
<tr>
<th>Compentency Statement</th>
<th>Mean</th>
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<tbody>
<tr>
<td>Understand the relationship between environmental hazards and human health.</td>
<td>3.39</td>
</tr>
<tr>
<td>Access information resources related to environmental hazards and health.</td>
<td>3.21</td>
</tr>
<tr>
<td>Counsel clients about how they can reduce risks associated with environmental hazards.</td>
<td>3.08</td>
</tr>
<tr>
<td>Conduct environmental and exposure histories.</td>
<td>3.05</td>
</tr>
<tr>
<td>Answer clients' questions about the harmful effects of pollution.</td>
<td>2.91</td>
</tr>
<tr>
<td>Plan and implement care for clients with environmentally-induced diseases.</td>
<td>2.81</td>
</tr>
<tr>
<td>Serve as an advocate for reducing environmental hazards.</td>
<td>2.70</td>
</tr>
<tr>
<td>Exert a direct influence on environmental public policy.</td>
<td>2.53</td>
</tr>
<tr>
<td>Provide information to community groups about local environmental risks.</td>
<td>2.45</td>
</tr>
</tbody>
</table>
With regard to the number of clinical or field experience contact hours, over two-thirds (70%, n=63) of the respondents’ programs provide four or less hours focused specifically on environmental health, and nearly one-third (32%, n=29) provide no dedicated clinical or field experiences in environmental health, as depicted in Figure 4. Only 8 programs (10%) devote more than eight hours to this area of emphasis. The mean number of clinical/field experience hours for the sample was less than 2 hours; the modal response was zero hours.

Barriers to Greater Emphasis on Environmental Health

When asked to identify the primary reason they believe nurse practitioner programs may place less emphasis on environmental health relative to other curriculum topics, over two-thirds (69%, n=62) of respondents stated the nurse practitioner curriculum is already crowded (Table 2). In the comments section, several respondents made such remarks as, “We really don’t have time to cover all the content we need to,” “It is not given a full class...because of curriculum demands,” “There’s already too much to learn!”

The second most frequent reason, lack of available resources to develop and teach environmental health, was cited by only seven (8%) directors. A view of the topic as unnecessary to the nurse practitioner curriculum and lack of faculty qualified to teach environmental health were each selected by five (6%) program directors (“Lack of faculty expertise is a problem,” “We are recruiting for an occupational health nurse practitioner—administrative support and salary support are crucial”). Other reasons cited included the priority given to other topics (“Right now, environmental health is ‘nice to know’ rather than ‘need to know’ content,” “More focus is placed on physical and psychosocial topics”) and the fact that environmental health is just now, as one respondent wrote, “coming into its own.”

Factors Likely to Increase Emphasis on Environmental Health

The final survey question asked program directors to identify factors that would be likely to increase the emphasis on environmental health in their program. A list of seven factors was provided, with an option to identify “other” factors, and respondents were directed to circle “all that apply.” Results are summarized in Table 3. One-half (50%, n=45) of the respondents reported that having nursing faculty with expertise in environmental health would be likely to increase the emphasis, while...
TABLE 2
Barriers to Greater Emphasis on Environmental Health in U.S. Nurse Practitioner Programs

"In your opinion, the primary reason nurse practitioner programs may place less emphasis on environmental health relative to other curriculum topics is because:"

<table>
<thead>
<tr>
<th>Reason</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>The curriculum is already crowded.</td>
<td>62</td>
<td>69%</td>
</tr>
<tr>
<td>There is a lack of available resources to develop and teach this topic.</td>
<td>7</td>
<td>8%</td>
</tr>
<tr>
<td>The topic is viewed as unnecessary.</td>
<td>5</td>
<td>6%</td>
</tr>
<tr>
<td>There are not enough qualified faculty to teach this topic.</td>
<td>5</td>
<td>6%</td>
</tr>
<tr>
<td>The topic is not emphasized on certification exams.</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>11%</td>
</tr>
</tbody>
</table>

TABLE 3
Factors Likely to Increase the Emphasis on Environmental Health in U.S. Nurse Practitioner Programs

“What factors would be likely to increase the emphasis on environmental health in your program?”
(Respondents were instructed to "circle all that apply."

<table>
<thead>
<tr>
<th>Factor</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing faculty with expertise in environmental health.</td>
<td>45</td>
<td>50%</td>
</tr>
<tr>
<td>Availability of information resources related to environmental health.</td>
<td>36</td>
<td>40%</td>
</tr>
<tr>
<td>Institutional resources to support the development and teaching of this topic.</td>
<td>30</td>
<td>33%</td>
</tr>
<tr>
<td>Community need.</td>
<td>29</td>
<td>32%</td>
</tr>
<tr>
<td>Greater emphasis on environmental health on certification exams.</td>
<td>26</td>
<td>29%</td>
</tr>
<tr>
<td>Non-nursing faculty with expertise in environmental health.</td>
<td>17</td>
<td>19%</td>
</tr>
<tr>
<td>Stronger leadership and support from administration.</td>
<td>14</td>
<td>16%</td>
</tr>
<tr>
<td>Other</td>
<td>78</td>
<td>9%</td>
</tr>
</tbody>
</table>

two-fifths (40%, n=36) emphasized the availability of information resources related to environmental health as an important factor. The factors selected least often were stronger leadership and support from administration (16%, n=14) and non-nurse faculty with expertise in environmental health (19%, n=17). Several other reasons that would be likely to increase the emphasis were cited, including lengthening the program, eliminating or decreasing the emphasis on other specific content and clinical experiences, shifting the focus from treating disease to promoting health and preventing illness, valuing of the topic by program faculty, and “strong nursing role models in environmental health.”

Comments and Concerns
Twenty-four respondents (27%) took advantage of the opportunity to write additional comments. Their comments reflected a diversity of perspectives and concerns, ranging from fear of further fragmenting the curriculum (“I get nervous about attempts to dissect the curriculum into pieces. It shows a focus on content rather than on the process of accessing information to use for clinical decisions”) to emphasizing the integrated nature of environmental health (“Our program may integrate more environmental health content than we realize because it’s part of many problems we see as primary care NPs,” “All courses touch on environmental hazards across the lifespan,” “Although not a specific class topic in many instances, environmental health is threaded throughout our curriculum”).

Several respondents indicated that the questionnaire had helped raise their consciousness about the topic (“This is an important area and this questionnaire is forcing me to examine how I can include this information in a structured way...” “We need to address these issues more comprehensively”), while others requested information (“Any resources you know about would be greatly appreciated”) and assistance with how to incorporate environmental health into the nurse practitioner curriculum.

Conclusions and Recommendations
The findings of this study reveal that more than two-thirds of nurse practitioner program directors believe greater emphasis should be placed on environmental health in their curricula, yet concerns about already overburdened curricula and lack of faculty preparation in the area of environmental health are viewed as major barri-
ers. Based on respondents’ comments and economic constraints, an add-on approach to the curriculum is not likely to gain favor among nurse practitioner program faculty.

The increasing volume of information available to health practitioners makes it virtually impossible to teach or to know all that is necessary for safe, effective, comprehensive practice. Instead, revamping the teaching-learning process to help students acquire broad competencies, including those related to environmental health, is more likely to be successful in enhancing the skills, attitudes, and flexibility that nurse practitioner graduates must have to address the health care needs of individuals, families, and communities that are related to person-environment interactions.

One way to do this is to shift from a content-driven curriculum to one that requires active inquiry and critical thinking. For example, a case study or problem-based approach to learning that incorporates environmental factors is a more efficient way to ensure that students acquire competencies related to environmental health rather than simply adding content to the curriculum. Including assessment of environmental hazards and risks as a routine part of patient or community assessment also enhances students’ awareness of the importance of environmental health. Nurse practitioners must also learn to access and critically evaluate information resources, whether electronic or print, and apply what is learned. Such strategies can help students learn to investigate and consider environmental factors in their clinical practices.

The fact that more than one-third (n=67, 36%) of the nurse practitioner programs surveyed did not respond, and that, of the 120 who did, 30 (25%) viewed the topic of environmental health as unimportant for their program and thus did not complete the questionnaire, probably indicates that a substantial number of nurse practitioner programs are not addressing environmental health as a component of advanced nursing practice. This may reflect differences in the practice or population focus of these programs. For example, a program that prepares acute care nurses for practice in critical care or neonatal intensive care may emphasize environmental health competencies less, if at all, than programs which prepare nurse practitioners to deliver primary care to individuals and families in community-based settings. However, knowledge of environmental factors that affect health, and competencies to help clients manage their health in the context of their living and work environments, should be considered essential to safe, comprehensive, effective advanced practice care, regardless of practice setting.

With the shift from individual to population-focused care, it will become increasingly important to prepare nurse practitioners to address the health problems of groups of clients and issues of public policy that pertain to such. Surprisingly, though, providing information to community groups about local environmental risks and exerting a direct influence on environmental public policy were the competencies ranked lowest by respondents. While this indicates that nurse practitioner programs currently do not place great emphasis on population-focused care or public policy related to environmental health, we do not know to what extent program directors believe such emphasis should be increased. There is little doubt that in the future it will be important for primary care, and perhaps other nurse practitioners to have sufficient knowledge and skills to address community health and public policy issues related to environmental health.

Clearly, the results of this survey indicate that the majority of NP program directors would prefer to increase the emphasis on environmental health in their programs. Given the rising incidence of health problems caused or aggravated by environmental factors, as well as proliferation in the numbers of advanced practice nurses who are providing primary health care services, NP program directors may find ways to ensure that their graduates are trained to incorporate environmental factors affecting their clients’ health into their daily practice.

References


