

Unit IX:

Research

INTRODUCTION

Since the early days of professional nursing practice, nurses have been observing and analyzing environmental data. Nurses have used their findings to influence the care they provide. In the 1850's Florence Nightingale subscribed to the health theory of the time, miasma. Miasmatic theory held that "bad air" was responsible for diseases such as cholera and chlamydia. Of course, now we know that is incorrect. But, it took people willing to look at the problem differently, ask questions of those exposed, and conduct further research to advance our understanding of the impact of the environment on our health. Technological advances, such as the microscope, helped as well.

The scientific community, including nurses, has made observations and analyzed data to accurately identify what is happening related to human health and the environment. Over time the theories that frame our understanding of a problem have changed. Advancing our knowledge of how our environment influences our health does not occur unless we formally examine a problem through research methods. Nurses at all levels of practice are positioned to make observations, collect data, and analyze data regarding the environmental impact on the health of individuals, families, communities, and nations.

This unit describes the work of nurses who are engaged in environmental health research. Each nurse researcher has been interviewed and the answers to the interview questions are provided. As you read about each researcher and his/her study consider: 1) What was the environmental problem the nurse researcher addressed (the research question)?; 2) What was the target population (the sample or participants)?; 3) How could their findings influence the patients or populations that you care for?; 4) Have their findings made you change the way you think about an environmental problem?; and, 5) How might you address and environmental health concern through research?

MARIA AMAYA, PHD, RNC, WHNP-BC
 Professor of Nursing
 Wakefield Professor of Health Sciences
 Women's Health Care Nurse Practitioner
 University of Texas at El Paso

(1) Background: Could you tell me about your academic background and nursing career? How did you get interested in environmental health? How did you get interested in this research topic and why is it important?

Educational Background:

BSN 1976 University of Texas at El Paso

MSN 1978 Texas Woman's University

PhD 1986 New Mexico State University

WHNP 1994 Certificate UT Southwestern Medical Center

GIS certificate 2012 The Johns Hopkins University

Nursing Career: I have been a staff nurse and unit charge nurse from 1976 through 1993. When I became a women's health care nurse practitioner in 1994 I switched my role and clinical setting. I provided primary women's health care as well as specialty women's health care in out-patient settings. My patients were mostly low-income women of Mexican descent throughout the life-span. I returned to UT Southwestern Medical School in 2002 to obtain training in cervical colposcopy. I, therefore, have experience in diagnosing and treating abnormal pap results. In that experience, I was exposed to women in the sex trade, women with HIV/AIDS and women with herpes and other STD's. I continued to develop my conceptual framework for practice through praxis. My eyes were opened to new situations and I learned to provide quality individualized care to these women. I have thoroughly enjoyed my nursing practice experience, which has been done mostly on a part-time basis throughout my career. It has been done in conjunction with my role as an educator and researcher. In this sense, my journey has been unique and exciting. I have met colleagues and friends from all backgrounds and perspectives.

Interest in environmental health: Environment is one of the four metaparadigms of nursing theory, including nursing, person, and health. Environmental exposures are causative and contributory factors to many chronic and acute health conditions in our time. Genetic factors are important contributory factors. Epigenetics and phenotypic mutations passed down to children are ripe for investigation in our understanding of health and illness. Therefore, I was led down the path of genetics and genomics. I trained in a colleague's laboratory, the

University of New Mexico, Molecular Epidemiology Lab, in 2007 under the direction of Dr. Esther Erdei and colleague. I learned the techniques for extraction and amplification. Today, I teach the DNP course Nurs 6340 Clinical Genetics. I have a good understanding of that field. I believe the study of environmental health goes well with the study of genetics.

My research grants focused on the effects of hazardous heavy metals exposures and the relationship between air quality and asthma. Once again, my path opened up to study geographic information systems (GIS), and I earned a Graduate Certificate in GIS from Johns Hopkins in 2012. I live in a medically-underserved region, with a low-income and low-educational level population of Mexican descent. This population is under-studied. Added to my unique skill set, I believe my research is critically important to advancing knowledge about environment and health in this population.

(2) Description of research: What is your research question(s), methods, results, and implications for practice and policy?

My first grant was an NIH ROI from the National Institute of Environmental Health Sciences (NIEHS). The focus was on binational mapping the geographic distribution of lead in the soil and measuring children's blood lead levels. This was a learning experience for me. Firstly, I was kicked out of Juarez Mexico by political authorities. I was threatened with arrest, even. So I learned that my studies were politically threatening to bureaucracies. I believe that environmental health researchers need to cope with this possibility. Although the study objectives were completed in El Paso, the second most important thing I learned was that the techniques for measuring blood lead level must be well thought out. For example, the samples were tested by Atomic Graphic Furnace, and this did not allow for much variability of scores to allow for statistical analysis. Later I purchased a Lead Analyzer I (for its low detection capability) and a Lead Analyzer II (for its clinical acceptance). I struggled with not having autonomy to provide results and found I needed a physician colleague to review the results. The lack of full autonomy for nurse practitioners (NP's) in Texas was an obstacle. Today, I am developing manuscripts to report my results. I learned how to deal with huge data bases, and the paper involved. Thankfully, I have adopted computer technology to record keeping, devising ways to comply with Human Subjects mandates while minimizing paper. There were many other lessons but these were the major ones. My team was awarded an RV van, which I equipped to do this work in the field. My next step would be to implement the follow-up armed with new knowledge, skills and experience.

My second major grant was as the co-investigator in a city-wide project to map air quality and measure prevalence of asthma among Hispanics of Mexican descent. My previous experience managing large projects came in handy. Our findings were important because of the meticulous epidemiologic methodology, the use of GIS, and the results showing reliable, replicable data on asthma in Hispanics of Mexican descent. Respiratory illnesses are rapidly becoming common among both children and adults. This Project also has potential for follow-up. Having the RV, the experience, the instruments, the skill set all bode well for continuing my research.

(3) Collaborators: What individuals, communities, or non-profits did you work with?

I was an original inter-disciplinarian before inter-disciplinary research was "cool". It helped that my nursing theoretical framework was Betty Newman's Systems Theory, which originated as an inter-disciplinary theory for nurses. I was already open-minded about the idea, and did not have territorial issues (at least not many). I have worked with geologists, physicians, physician-assistants, chemists, engineers, and other disciplines in my work.

(4) Funding: Who funded your research?

My major funding has come from NIH, namely NIEHS. However, I have been funded by Environmental Protection Agency (EPA). I have participated in over \$20 million in externally-funded research projects.

(5) Did you publish your research? Can you provide a link for us to share? Did you engage in any policy-related efforts associated with your research?

I will answer the second question first. After my experience in Juarez Mexico I developed an aversion to politics and research. I can say that rather I was engaged by policy makers, and it was not always pleasant. When one is an objective scholar, and the data are authentic, there will always be policy-makers who are very happy with your findings and those who are very unhappy. The same is true for communities and community leaders. I have published some of my research, but I am dealing with a tremendous amount of data and have been slowly digesting it for publication. I am tempted to take on "easier" projects, but I find that doing "good" research often involves broad objectives. This is especially true when the researcher's focus is on community health.

See URL for photo of Dr. Amaya; see pages 8 and 9 for additional information <https://academics.utep.edu/Portals/297/Magazine/SON-WEB.pdf>

ADELITA CANTU, PHD, RN

University of Texas Health Science Center, San Antonio
School of Nursing, Family and Community Health Systems
San Antonio, TX

(1) Background: Could you tell me about your academic and career background? How did you get interested in environmental health? How did you get interested in this research topic and why is it important?

Bachelors in San Antonio, Texas. Masters in Dallas from Texas Woman's University in 1985. PhD in 2006 from University of Texas Health Science Center.

My career path as a nurse has always been community and public health nursing for almost 40 years. I am interested and deeply passionate about all issues with the environment and community that have an impact on resident health; the social determinants of health are very broad and all encompassing and related to this work as well.

As I pursued advanced education, I discovered that I had the ability to have some impact through my research and my expertise, generally looking at vulnerable populations, particularly minority, and even more so Hispanics. From that interest, grew knowledge of many of the things in the environment that keep Hispanics and vulnerable populations from reaching their optimum level of health. I have done work on what it takes in terms of the initiation and sustainability of healthy lifestyles i.e. physical activity across the lifespan of Hispanics, which has blended into cultural perspectives of physical activity. A natural outgrowth of that has been the environment itself. I come from the barrio myself. I live and work in neighborhoods that have poor infrastructure when it comes to roads, streets, air, and educational level that children are exposed to.

I have always been a person who wants to be a part of movements. I joined the National Association of Hispanic Nurses. Our national president knew of my interest in environmental health and, when the Alliance of Nurses for Healthy Environments (ANHE) was looking for more diversity in their steering committee, she tasked me for that and I have been working with them ever since about 2007-2008. I have an interest in environmental health, but more broadly an interest in public health.

(2) Description of Research & (3) Collaborators

The study is called "Community Perceptions of the Environmental Issues Related to Donna Reservoir." My research partners are from South Texas, including an anthropologist and sociologist. In this study, we were looking at residents of the colonias of Hidalgo County.

Colonias are unincorporated areas that lack infrastructure and are principally Hispanic, either Mexican Americans or undocumented Hispanics. The Donna Reservoir and its canal system is a Superfund site because fish are contaminated with PCBs. The EPA still does not know where the PCBs are coming from, but the suspicion is that there are transformers buried in the reservoir. What is known is that the fish are contaminated, and the residents are fishing, eating the fish, and selling the fish. PCBs are a known neurotoxin and have been banned.

We formed an academic and community partnership with a non-governmental organization called the Institute for Valley Health. We worked with them to arrange focus groups so we could understand more richly how the residents interact on a daily basis with the Donna Reservoir: Are they fishing and do they know about the fish (contaminated with PCBs)?

We wanted to design culturally-tailored messages from the data received, and we are still working on that. From the focus group we found that although the residents are living in poverty they do have smart phones. This is their line life. This is how they communicate and get information. We asked for an extension of our study to ask them how they use information from their smart phones so that we can better design our messages. What we have discovered from the focus group is that we are still challenged to create something that is meaningful for the residents.

(4) Funding

Pilot funding is from the Community Translation Science Award that the Health Science Center received from NIH.

(5) Publication and Policy

Publication is pending. Nothing policy related yet. I am working with a group called Texas for Responsible Hydrofracking to have some policy influences.

(6) Anything to Add

I also work in San Antonio with a non-profit called San Anto Cultural Arts. We taught children from their day camp the EPA curriculum on climate change. San Anto also helped them to create three public service announcements on how the community can be mindful of climate change issues. We called it an eco-film camp. In 2015, I am getting ready to submit an application for a grant with San Anto to address solid waste disposal in the barrio where there is trash all around and illegal dumping. We are going to take what San Anto does in terms of creative writing and mural making and try to deliver

messages to the community about the environment and solid waste.

We are still struggling to find funding for research on fracking and the Eagle Ford Shale in Bear County. What we know is that the state of Texas is not doing enough in terms of air monitoring. We wrote a grant to provide portable air monitors to residents in the Eagle Ford Shale so they can do their own monitoring. We were going to attach that with qualitative interviews with residents and healthcare providers around that area. We have submitted this research for funding. We may have to look into private funds because it may be too volatile for state or federal funding.

VIKI CHAUDRUE, EDD, MSN, RN

Nursing Director

Mendocino College

Ukiah, CA

(1) Background: Could you tell me about your academic and career background? How did you get interested in environmental health? How did you get interested in this research topic and why is it important?

Suffice it to say that I have worked in many capacities as an RN, both on the East and West Coasts. I received my doctorate degree, Ed.D, in August of 2013.

I think I was always interested because my parents taught me how to respect the environment and how to garden. My *passion* for environmental health began when I became a white water rafting guide. In that capacity I was able to go into areas that were protected and undeveloped. I soon craved to be in the wilderness, and disliked coming back into "civilization" because I believe we have destroyed most of what was civilized due to personal greed, corporate greed, ignorance, and apathy. More importantly, I did not understand why nursing and medical education did not address environmental health, because clearly it was all intertwined. But then a colleague of mine mentioned that she had gone to a conference in San Francisco about environmental health and nursing education, and she gave me some of the pamphlets and handouts that she had received. That is how I became involved with the Alliance of Nurses for Healthy Environments (ANHE) in 2010.

(2) Description of Research: What is your research question(s), methods, results, and implications for practice and policy?

My dissertation pertained to educating undergraduate nursing students on the toxins in personal care products (lotions, deodorants, cosmetics, etc). I became interested in this topic because the personal care products that are often offered to clients after a mammography frequently contain substances that are known endocrine disrupters. I used a mixed-method approach and the results indicated that graduates of my local nursing program would have liked information pertaining to my research topic during their undergraduate education.

(3) Collaborators: What individuals, communities, or non-profits did you work with?

University of California at San Francisco's (UCSF's) [Program on Reproductive Health and the Environment](#) and of course, the nurses that belong to ANHE.

(4) Funding: Who funded your research?

Me

(5) Publication and Policy: Did you publish your research? Can you please provide a link for us to share? Did you engage in any policy-related efforts associated with your research?

My research has not been published yet, although I did obtain a copyright. I have not engaged in policy-related efforts regarding my research; however, I have engaged in policy-related efforts pertaining to fracking and the passage of California SB 1132 to impose a moratorium on fracking. (This bill was defeated in 2015.)

ROSEMARY CHAUDRY, PHD, RN, MHA, MPH, PHCNS-BC

Planner - Delaware (Ohio) General Health District
Adjunct Faculty- Ashland University College of Nursing
Ashland, OH

1) Background: Could you tell me about your academic background and nursing career? How did you get interested in environmental health? How did you get interested in this research topic and why is it important?

My academic background is BSN, MS, and PhD in nursing with minors in public health and health policy; masters degrees in health administration (MHA) and public health (MPH). My interest in Environmental Health (EH) began when I filled in for a colleague at a conference on methylmercury at the University of Wisconsin provided through a grant to two nurse EH researchers- Drs. Jeanne Hewitt and Ann Backus. If you didn't have previous coursework in environmental health, you had to complete the American Association of Occupational Health Nurses (AAOHN) EH modules. Between what I learned in the modules and at the conference, I was hooked. I took an EH course, decided to focus on that area in PH nursing, and completed the coursework I had done for my public health minor in my PhD program to earn my MPH degree. I believe strongly that the environment--from the first environment in utero--is a key determinant of physical, social, and emotional health.

(2) Description of research: What is your research question(s), methods, results, and implications for practice and policy?

I am retired now, but as a nurse faculty member my areas of focus were community interventions and health workforce issues related to childhood lead poisoning, asthma, healthy homes education for nursing students, and social justice in marginalized communities. My research methods included lead poisoning education for providers, a mock home environment for nursing healthy homes assessment, community based participatory research (CBPR) for translational research on EH hazards in a marginalized community, and community education and screening related to childhood lead poisoning. Implications for practice were the importance of teaching students and practicing nurses how to assess the home environment using the healthy homes framework, addressing health providers' perceived barriers to obtaining lead tests for children, supporting community representatives to advocate for changes to reduce litter and to promote completion of Brownfield remediation projects, and continued support and expansion of home-based education for families of urban children with asthma who live in poverty.

In my last position with a local health department, I supervised the staff person who did the agency's first EPH report, health impact assessment, and also wrote a small grant (which was funded) for local education and outreach related to lead poisoning and healthy homes. Now that I am retired, I am continuing my advocacy in areas related to climate change, fracking, indoor and outdoor air, chemicals, water, and the built environment including school EH assessments, health homes, built environment and green building.

(3) Collaborators: What individuals, communities, or non-profits did you work with?

My main EH research colleague was/is Dr. Barbara Polivka, who is now at the University of Louisville. (We worked together at Ohio State University for 8 years.) I have worked with my local county, an inner city neighborhood in Columbus Ohio, and with the Ohio Department of Health, Columbus Public Health, and Marion Public Health.

(4) Funding: Who funded your research?

Funding sources include Ohio Department of Health, Ohio EPA, Ohio State University Center for Clinical and Translational Science.

(5) Did you publish your research?

YES.

Can you provide a link for us to share?

<http://www.ncbi.nlm.nih.gov/pubmed/2164448> | <http://onlinelibrary.wiley.com/doi/10.1111/phn.12071/full>

<http://europepmc.org/abstract/MED/22909044>

<http://ehp.sagepub.com/content/32/1/23.full.pdf>

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3589729/>

Did you engage in any policy-related efforts associated with your research?

Intervention to support local neighborhood policy prohibiting discarding solid waste in inner city neighborhood; supported revising education for health care providers on lead testing requirements for children; support of state asthma plan

(1) Background

Masters in pediatric nursing. Always had an interest in children. PhD at University of Cincinnati in Department of Environmental Health. Mentor at the time was Barbara Valanis, an epidemiologist, and her area was occupational health. Interested in extending pediatrics to the broader area of environmental health.

(2) Description of research

Research in 3 areas: children's environmental health, occupational health, and health of military populations. Strong focus in research has been exposure to chemicals, whether that is occupational exposure to chemicals like nurses handling antineoplastic drugs, or farmworkers handling pesticides, to military populations exposed to chemical warfare agents or fumes from burn pits.

(3) Collaborators

30 years ago studied nurses handling antineoplastic drugs for dissertation. Then studied veterans exposed to chemical warfare agents. Finally studied children exposed to pesticides, then workers exposed to pesticides, including adolescent workers.

(4) Funding

Continued program of research from National Institutes of Health (NIH), National Institute for Occupational Safety and Health (NIOSH), and Veterans Affairs (VA).

(5) Publishing and Policy

Over 80 publications. Most cited work deals with study design issues: how to design the studies to best capture exposures and health effects. Other studies deal with engaging communities and community-based participatory research: how to study environmental exposures in disadvantaged communities and populations.

Website for recent publications: click on publications

http://www.nursing.emory.edu/directory/profile.cfm?PEOPLE_NUMBER=1440

RUTH MCDERMOTT-LEVY, PHD, MPH, RN
 Associate Professor, Villanova University
 Director, Center for Global and Public Health
 College of Nursing
 Villanova, PA



(1) Background: Could you tell me about your academic background and nursing career? How did you get interested in environmental health? How did you get interested in this research topic and why is it important?

BSN: Wilkes University

MSN: Villanova University, Community Health Nursing & Nursing Education

MPH: University of Massachusetts – Amherst

PhD: Villanova University

I have always seen the connection between the environment and human health from working in a cardiac unit as a young nurse to working in home care for many years. Where and how you live matters.

I served as the co-chair of Pennsylvania State Nurses' Association Environmental Committee from 2009-2012. During that time, the fracking boom was taking off in Pennsylvania and we began working to educate nurses and other health professionals regarding the health impacts of fracking. As we were doing that work it was evident that more research about the health impacts of fracking communities was needed.

(2) Description of research: What is your research question(s), methods, results, and implications for practice and policy?

I am working on a community based participatory research (CBPR) project in natural gas development communities of Northeastern Pennsylvania. In phase I, I completed a qualitative descriptive study to determine health concerns of communities that are experiencing the impacts of the natural gas industry and which methods would be most effective to disseminate the health information. Residents were concerned about their air and water quality, and felt powerless and stressed by the changes in their communities. In phase II, I am using Dixon et al. (2006) Integrative Model for Environmental Health Education and Shoemaker et al. (2014) Patient Education Material Assessment Tool to determine the educational materials that most adequately address the residents' concerns that were identified in phase I and where are the gaps as noted by the residents.

I am currently working on data collection in a qualitative descriptive study to determine health concerns of Northeastern Pennsylvania communities that are experiencing the impacts of the natural gas industry. I am using focus groups and individual interviews to collect the data.

I selected CBPR as my research goal because I was speaking with a Villanova colleague, Steven Goldsmith, who is studying stream water quality in Pennsylvania's fracking regions and he shared that the people would tell him that the researchers come and collect their data and they never return to let any one know the findings. As a public health nurse, I found this unacceptable, I so I am working to collaborate and form partnerships with community members.

(3) Collaborators: What individuals, communities, or non-profits did you work with?

I have worked with several grassroots community organization as well as churches and service groups to solicit participation in this research.

(4) Funding: Who funded your research?

Phase I was funded by Villanova University, College of Nursing Center for Nursing Research. I also had a research assistant, Victoria Garcia. Phase II was funded by Villanova University Summer Research grant and my research assistant is Mika Inigo.

(5) Did you publish your research? Can you provide a link for us to share? Did you engage in any policy-related efforts associated with your research?

Publication related to research:

- McDermott-Levy, R., & Garcia, V. (2016). Health Concerns of Northeastern Pennsylvania Residents Living in an Unconventional Oil and Gas Development County. *Public Health Nursing*. doi: 10.1111/phn.12265 <http://www.ncbi.nlm.nih.gov/pubmed/27079450>
- McDermott-Levy, R., Kaktins, N. & Sattler, B. (2013) "Fracking, the environment, and health: An examination of energy practices and policies that threaten patients," *American Journal of Nursing*, 113 (6), 52-57.
- McDermott-Levy, R. & Kaktins, N. (2012). "Preserving health in the Marcellus region," (a CE offering). *Pennsylvania Nurse*, 67(3), 4-12.
- Advocacy: I have advocated for clean air with the [Pennsylvania State Nurses Association](#) and climate change with ANHE and PennEnvironment. I am a founding member of [Protect Pennsylvania:Health](#)

Professionals for a Livable Future, a consortium of health professionals advocating for health protective regulations related to the state's natural gas industry. Ruth is also the ANHE Education workgroup co-chairperson.

REFERENCES

Dixon, J.K., Dixon, J.P., Ercolano, E., Hendrickson, K. C.& Harrison, T.W. (2006). A vision of nurses and doctors as critical links between good science and community action for environmental health solutions. *Harvard Health Policy Review*, 7 (1), 39-47.

Shoemaker, Wolf & Broch, (2014). Development of the Patient Education Materials Assessment Tool (PEMAT): A new measure of understandability and actionability for print and audiovisual patient information. *Patient Education and Counseling*, 96, 395-403.

BARBARA POLIVKA, PHD, RN

Professor; Shirley B. Powers Endowed Chair in Nursing
University of Louisville School of Nursing
Louisville, KY

(1) Background: Could you tell me about your academic background and nursing career? How did you get interested in environmental health? How did you get interested in this research topic and why is it important?



Bachelors and masters from University of Cincinnati. PhD from Ohio State University. Worked in emergency room, intensive care, med surg, home health. After PhD worked at Ohio Department of Mental Health for a couple of years as research program educator. Then went on faculty at the Ohio State University College of Nursing and was there for 20 years. Then came to University of Louisville 2.5 years ago and have been here ever since.

My interest in environmental health started with my dissertation. For my dissertation I worked with a nurse epidemiologist who looked at the environmental factors related to development of cerebral palsy in children. We did a case control study and I was the research assistant and collected the data. We explored environmental influences but didn't really find any differences between cases and controls; but it got my interest going.

I started out looking at one exposure, lead poisoning, then moved into broader poison prevention. Now I work on healthy homes and look at all the exposures in the entire home.

(2) Description of research: What is your research question(s), methods, results, and implications for practice and policy?

I did a lot of work early on with lead poisoning prevention. I worked with Ohio Department of Health and Columbus Public Health Department in this area. We did 7 studies that were looking at whether or not children were screened according to policy and protocol. Some studies were based on data available from Medicaid. We were able to look at the data and identify whether they were screened appropriately. What we found was that most were not. This influenced policy in having the Department of Health look at how they were approaching providers, what kind of education they were giving to providers, and what kind of incentives and disincentives they were giving to Medicaid providers in order to get them to screen children.

After that we evaluated the Pediatric Lead Assessment Network Education Training or PLANET, which was the training program the Ohio Department of Health had for healthcare providers. We looked at the effectiveness of their educational training. This was when the Internet was first starting to be used for education. Prior to that, education was one-to-one. We did focus groups and reviews of existing data and realized people wanted Internet education that was short, and they could look at on their own time and get the information they needed.

(3) Collaborators: What individuals, communities, or non-profits did you work with?

Ohio Department of Health and Columbus Public Health Department

(4) Funding: Who funded your research?

Medicaid in Ohio. Ohio Department of Jobs and Family Services.

(5) Did you publish your research? Can you provide a link for us to share? Did you engage in any policy-related efforts associated with your research?

All of my research has been published and you can find links in my CV. <https://louisville.edu/nursing/directory/polivka-barbara>

ELIZABETH C SCHENK, PHD, MHI, RN

Nurse Scientist/Sustainability Coordinator,

St. Patrick Hospital

Missoula, MT and

Assistant Research Professor

Washington State University College of Nursing

Spokane, WA

(1) Background: Could you tell me about your academic background and nursing career? How did you get interested in environmental health? How did you get interested in this research topic and why is it important?



I have been drawn to the natural world since I was a child. I found being in nature, even being outdoors with my feet on the ground to be calming and deeply satisfying. This general groundedness in nature led to my forming a group called the “Anti-Pollutionists” in the 6th grade (!) complete with a neighborhood carnival through which we raised money that helped buy trees for the city. In high school I did a yearlong study (in chemistry class) on the capacity for water hyacinth plants to uptake heavy metals in their roots. I also made an animated film (in film-making class) about can recycling. So, this tendency toward concern and involvement about the natural world has been a theme for a long time.

My first bachelor’s degree was in Botany. I was very interested in ecology, and perplexed by the ways that humans were harming other species and ecosystems. When I entered the nursing profession, I immediately felt a collision of values within my experience. I knew how important nursing work was. I felt I was truly relieving suffering, and even saving lives. And yet, I also was horrified by the amount of waste, and later learned more about chemicals and energy use as well.

My first recycling project in nursing was in 1993. Ever since then, I have been working to decrease environmental impacts in my hospital. In 2007 our hospital made a more focused commitment to environmental stewardship and I was able to dive more deeply into content areas for healthcare sustainability. As I attended conferences and saw the nationwide (and worldwide) work being done to decrease environmental impacts of healthcare, I began to focus more on nursing practice itself. Nurses are the largest body of healthcare professionals, are present in a vast majority of healthcare experiences, and can be great advocates for change. One year at Clean Med (national conference on healthcare sustainability), I asked myself,

“Why isn’t anyone researching the role of nurses?” A few minutes later I felt the proverbial tap on my shoulder and said to myself...Oh, I guess this is what I’m doing next. This led to my work in nursing research and the earning of a PhD in nursing.

(2) *Description of research: What is your research question(s), methods, results, and implications for practice and policy?*

Though nurses across the nation are often leaders in environmental stewardship in healthcare, it has not entered the world of nursing research, and only minimally in nursing education. Because there was very little in the published literature on the topic, I began my research with the question, “How aware are nurses of the environmental impacts of nursing practice?” There was no validated tool available to measure that, and no published papers about nursing awareness of these issues and their associated health risks. My dissertation work was to develop and test such a tool, which I called the Nurses’ Environmental Awareness Tool, or NEAT.

I began with a thorough scouring of available literature and websites. Then I drafted 160 items for consideration. I presented these to seven content experts across the nation, who helped ask clarifying questions, identified important or less important items, validated that important ones were included, and helped address confusing language or ideas.

I refined the items to 48 two-part items across six scales. These addressed nurse awareness of environmental impacts of nursing practice; how related nurses think those impacts are to health; ecological behaviors in the workplace and how difficult or easy they are; and ecological behaviors at home and how difficult or easy they are. I then tested the items in two cycles. The pilot phase was in three hospitals and the next phase (study phase) in four additional hospitals. During the two cycles 698 nurses responded, which allowed two phases of psychometric testing.

The scales performed well, with adequate reliability statistics and correlation scores. Because they performed well, I was able to analyze the results for content in a post-doctoral study. This yielded interesting findings about demographics and responses (age, education level, unit type, etc.) as well as how the scales relate to each other.

There are many implications for practice in acute care. Nurses could use the scales to compare data pre and post an educational intervention. Educators could use them to measure student awareness coming into a program. Nurses could use the scales to provide information about nurses’ adherence to ANA Standard 16, which states that

“the RN practices in an environmentally safe and healthy manner.” By understanding interactions between awareness and behavior, nurse administrators can help guide actions that result in lower impacts. By studying nurses, researchers can contribute to the broader body of knowledge in sustainability science.

(3) Collaborators: What individuals, communities, or non-profits did you work with?

My dissertation committee was intimately involved with my thinking and writing. They are: Celestina Barbosa-Leiker, PhD; Patricia Butterfield, PhD, RN; Cindy Corbett, PhD, RN; and Julie Postma, PhD, RN.

Alliance of Nurses for Healthy Environments (ANHE) nurses were encouraging and provided content expertise, including Barb Sattler, Denise Choiniere, and others.

(4) Funding: Who funded your research?

I had a small amount of financial support for tuition through my employer, Providence St. Patrick Hospital and the Providence Western Montana Health Foundation.

(5) Did you publish your research? Can you provide a link for us to share? Did you engage in any policy-related efforts associated with your research?

Link to dissertation research: Creating the Nurses' Environmental Awareness Tool (NEAT)

<http://whs.sagepub.com/content/63/9/381>

I work on a variety of efforts related to environmental stewardship broadly. I work on our community climate action plan; serve on a local river advocacy board; and guest lecture at the college of nursing, medical school, business groups. I work in our larger hospital system with 20 hospitals working on environmental stewardship, and to advance the business case in the organization.

I serve as co-chair of the Practice Workgroup for ANHE.