Community health nursing educators leading the way in environmental health

ACHNE 2012 Annual Institute
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1. Describe public health threats associated with environmental contamination.

2. Discuss national educational, research, and practice initiatives.

3. Summarize environmental health leadership initiatives.

4. Describe new opportunities for CHN educators to be innovators.
public health threats

EPA: 4 priority concerns
• water quality and quantity
• air pollution
land use & solid waste
climate change
pic of forest fire
public health threats

1. lifetime exposure to low levels of multiple contaminants

2. population stress
lead
volatile compounds in solvents and cleaning products
diesel fumes endocrine disruptors in plastic
pesticide residue
<table>
<thead>
<tr>
<th>Agent</th>
<th>Lifetime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radon</td>
<td>Exposure</td>
</tr>
<tr>
<td></td>
<td>Consequences</td>
</tr>
<tr>
<td>Lead</td>
<td>Exposure</td>
</tr>
<tr>
<td></td>
<td>Consequences</td>
</tr>
<tr>
<td>Particulates</td>
<td>Exposure</td>
</tr>
<tr>
<td></td>
<td>Consequences</td>
</tr>
<tr>
<td>Endocrine disruptors</td>
<td>Exposure</td>
</tr>
<tr>
<td></td>
<td>Consequences</td>
</tr>
<tr>
<td>Solvents</td>
<td>Exposure</td>
</tr>
<tr>
<td></td>
<td>Consequences</td>
</tr>
</tbody>
</table>

overlay of multiple exposures over one’s lifetime
poverty

substandard housing

stress

lack of preventive services
Health Affairs May 2011

Reducing The Staggering Costs Of Environmental Disease In Children, Estimated At $76.6 Billion In 2008

Leonardo Trasande and Yinghua Liu
Environmental exposures in childhood set the stage for illness over the lifespan.
The child is the father of the man

(William Wordsworth)
population stress
in light of these risks.....
where do CHN faculty fit in this picture?
how do we act in response to environmental health issues that are so profound and complex?
Environmental health actions have always been central to CHN practice
Lets look at.....
the national context and
initiatives underway
30 years of accelerated work by community health nurses
theoretical foundations

research

guidance documents from key nursing groups
theoretical foundations:

1986, chopoorian: ‘reconceptualizing the environment’
1990, butterfield: ‘thinking upstream’
2002, dixon and dixon: ‘integrative model’
TERRA conceptual framework: Key concepts and relationships

Macro-determinants: Ecologic- or societal-level antecedents of environmental health
- Physical-spatial
- Economic-resources
- Cultural-ideologic

EH Inequities: Differential distribution of resources available at the family level

ERR interventions

EH risks

EH mental models

Proximal outcomes

Distal outcomes

many others are working to deepen and extend theoretical foundation of environmental health
research
PubMed search: environmental health nursing with designated research support

- Search term: Environmental health nursing
- Limits: research support= 895
Search term: environmental health nursing = 3194
Search term: “environmental health” AND “nursing” = 629
a somewhat loose research taxonomy

1. descriptive studies addressing EH beliefs and knowledge
2. studies addressing the role of EH within an organization
3. eh program evaluation
4. intervention studies
5. conceptual foundations of research
6. comparative effectiveness research
7. methodology and/or instrumentation studies
8. national EH cohort studies
- Category 1.

- Descriptive studies addressing EH beliefs and knowledge
Category 1 example: beliefs and knowledge about EH

• Community environmental quality knowledge and awareness among nurses: developing and piloting an assessment survey in schools.
  – Shendell DG, Alexander MS, Huang Y.
Category 1. Descriptive studies addressing beliefs and knowledge about EH

- Citizens’ beliefs about
- Nurses’ knowledge of environmental health
- Students’
Category 3. Program evaluation addressing EH pilot projects or demonstration projects
Category 3 example

• Using a site visit to a contaminated location as a focus for environmental health education for academic and public health nurses.

• Backus AS, Hewitt JB, Chalupka SM.

Category 3. EH program evaluation

Ad libs

The effectiveness of an EH pilot project in _____A_____ addressing _____B_______ and designed to have an impact on _____C_______.

A. A school, hospital, or PH dept.
B. Medical waste, pesticides, indoor air quality
C. Students’ or nurses’ behavior and awareness
• Category 4. Intervention research
  • Includes RCTs
Category 4 example: intervention research

- Effectiveness of cleaning practices in removing pesticides from home environments.
  - McCauley LA, Travers R, Lasarev M, Muniz J, Nailon R.
• An intervention study was conducted to assess the effectiveness of cleaning windowsills in a sample of 10 farmworker homes.

• The cleaning of total OP pesticides on the windowsills was effective (median decrease was 0.0029 microg/cm(2), 1-sided p-value = 0.01).

• These results provide evidence that cleaning practices can reduce the amount of pesticides in agricultural homes; however the type of surface being cleaned and the pesticides present in the home may influence results.
Intervention research: Another example

• ERRNIE Study: Environmental Risk Reduction through Nursing Intervention & Education

• RCT examined the effectiveness of 4 public health nursing home visits

• Analyses revealed a significant impact from the PHN intervention
  – Parents’ EH self-efficacy
  – Parents’ Precautionary action stage
## Results

### General behavior self efficacy

<table>
<thead>
<tr>
<th></th>
<th>Intervention (n=119)</th>
<th>Control (n=116)</th>
<th>Group effect (95% CI) p-value</th>
<th>Group*Time p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>72.8 (17.4)</td>
<td>73.8 (16.2)</td>
<td>12.7 (8.0, 17.3) &lt;0.001</td>
<td>0.01</td>
</tr>
<tr>
<td>3 months</td>
<td>88.0 (12.1)</td>
<td>78.8 (16.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 months</td>
<td>88.4 (11.9)</td>
<td>82.4 (15.5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Graph showing General ERR Behavior](image)
Risk-specific self efficacy: Radon and water contaminants

![Graphs showing mean self efficacy over observation time for Radon and Water Contaminants with Intervention and Control groups.](image-url)
Effectiveness of a Household Environmental Health Intervention Delivered by Rural Public Health Nurses

Patricia G. Butterfield, PhD, RN, Wade Hill, PhD, RN, Julie Postma, PhD, RN, Phillip W. Butterfield, PhD, and Tamara Odom-Maryon, PhD

In previous work in rural Montana and Washington states, low-income families reported that much of the environmental health information they received was neither meaningful nor actionable. Parents viewed household environmental risks holistically, yet they almost always received agent (e.g., radon) or condition (e.g., asthma) specific educational pamphlets. Many parents reported being concerned about household risks, but felt “stuck” in their circumstances and unsure about what risk reduction steps to take; they asked for practical suggestions about what they could do to protect their children. These findings were consistent with those from other behavioral scientists who found that context- and image-based environmental health messages (e.g., Centers for Disease Control and Prevention [CDC] Healthy Homes portal) were often perceived as more meaningful than agent-focused information. This previous research also yielded evidence that when provided...
Category 6. Comparative effectiveness studies
The effect of graphics on environmental health risk beliefs, emotions, behavioral intentions, and recall.

Severtson DJ, Henriques JB.

Water results provided to client: format a

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
<th>Units</th>
<th>LOD</th>
<th>LOQ</th>
<th>Method</th>
<th>Analyzed</th>
<th>Analyst</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese, dissolved</td>
<td>12*</td>
<td>ppb</td>
<td>1.100</td>
<td>3.800</td>
<td>3113B</td>
<td>2/8/06</td>
<td>CB</td>
</tr>
</tbody>
</table>

*Note: Test result is over the manganese drinking water standard of 10 ppb.
Water results provided to client: format b

- 500 ppb: Stop showering
- 100 ppb
- 50 ppb
- 25 ppb
- 20 ppb
- 15 ppb

Drinking water standard: 10 ppb

- 7 ppb: Test well yearly
- Limit of detection: 1.2 ppb

Your test result is 40 ppb

Stop drinking

No recommended action
Water results provided to client: format c

- 500 ppb: Stop showering
- 100 ppb: Stop showering
- 50 ppb: Stop showering
- 25 ppb: Stop showering
- 20 ppb: Stop showering
- 15 ppb: Stop showering
- Drinking water standard: 10 ppb
- 7 ppb: Test well yearly
- Limit of detection: 1.2 ppb

Your test result is 12 ppb
Guidance documents from key nursing organizations
IOM report ‘Nursing, Health, and the Environment’
• AACN environmental sustainability recommendations for Colleges of Nursing

• July 2011
AACN nurse competencies: Nurses should:

1. Use health care resources in a judicious and thoughtful way.

2. Disposes of health care associated waste, including pharmaceuticals and biomaterials, in a responsible manner.

3. Recognizes the importance of minimizing health care’s biological, chemical, and physical waste stream.

4. Considers the adoption of policies aimed at promoting environmentally sustainable schools of nursing and/or clinical settings.
Alliance of Nurses for Healthy Environments (AHNE)
• ANA and APHA

• issues key recommendations addressing nursing practice, environmental health and environmental sustainability
• leadership, innovations, and action.
• We are not doing enough. Fast enough.
1. Quit nipping at the edges in regard to environmental health in nursing curricula.
How do we do that?

*IOM recommendations for nursing education in every nursing program.*

*AACN competencies met by all nursing students.*
2. Strengthen high-impact research.
greatest impact on public’s health
Research aimed at eliminating environmental health disparities due to race, place, income, class status, employment, or lack of regulatory oversight.
3. Bring the voice of CHNs forward to green healthcare.
U.S. Healthcare accounts for approximately 8% of the nation’s carbon footprint
• 33lbs of waste produced per staffed bed per day
4. Show our students what environmentally sustainable universities look like.
• U.S. higher education accounts for 2-3% of the nation’s carbon footprint
Using the practice lab to enhance students’ understanding of medical waste
Incorporate green principles into simulation experiences
Involve students in green healthcare initiatives
5. Political discourse; get into it.
childhood exposure to lead

anemia

behavior problems in adolescence

hypertension

renal disease

Connect the dots
Now you see it
Now you don’t

If you lived or worked in the Shoshone Valley of Idaho between 1970 and 1984, you may have been exposed to high levels of radon. Health problems may be showing up now even though you look and feel healthy. Call the Shoshone Hill Medical Monitoring Program today for education, free screening and information.

toll-free 1-877-201-4264
FOR FREE SCREENING INFORMATION
For the first time in 20 years, federal health authorities have lowered the recommended limit for lead exposure in young children, which they say could add 200,000 children to those believed to have unsafe lead levels in their blood.

The new standard, announced by the Centers for Disease Control and Prevention on Wednesday & applicable to children under 6, lowers the threshold to 5 micrograms of lead per deciliter of blood, from 10 micrograms per deciliter.
it’s time to quicken the pace
“our nation and planet can ill afford to perpetuate a reactive approach to environmental health...”
“nor should we wait to see downstream effects manifest themselves as lives are lost...”
“we should turn our efforts upstream, where the real problems lie.”