

# Evaluating an Online Environmental Health Course for Healthcare Professionals: An Integrative Approach

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# Course Design

- 4- 6 hour online course; free of charge
- Content
  - Introduction to Environmental Health
  - Taking an Environmental Medicine History
  - Air, Land, Water
  - Patient Waiting Room
  - Emerging Research
- Exam
- Course Evaluation
- [http://integrativemedicine.arizona.edu/education/online\\_courses/enviro-med.html](http://integrativemedicine.arizona.edu/education/online_courses/enviro-med.html)



# Study Purpose and Design

- ▶ To evaluate the feasibility and effectiveness of an online Environmental Health curriculum for healthcare professionals
- ▶ Pretest – Posttest – 30-day Follow-up
- ▶ Study Questions:
  - ▶ How effective is an online course in improving:
    - ▶ Medical knowledge about EM
    - ▶ Perceived seriousness of environmental issues (environmental concern)
    - ▶ Attitudes about importance of environmental health for patients
    - ▶ Attitudes about taking an environmental health history
    - ▶ Confidence in identifying environmental exposures/risk assessments and discussing exposure prevention with patients.
  - ▶ Do the improvements continue over time (30 days)?
- ▶ CME/CE credits provided as study incentive



# Learning Objectives

- ▶ Appraise the emerging research linking environmental toxins and the rise of complex chronic illness; and identify how an integrative medicine model may be applied in both prevention and treatment
- ▶ Identify the primary categories of chemical toxins present in the environment, and interpret how their mechanism of actions may impact human health
- ▶ Recognize and identify the range of toxins known to demonstrate endocrine disruptor activity in humans
- ▶ Identify vulnerable patient populations
- ▶ Apply a structured approach to taking an environmental health history that includes potential toxins in air, land, and water
- ▶ Acquire familiarity with consumer resources that can help individuals reduce environmental toxin exposures, and recognize how cultural and socioeconomic status may influence their exposures and ability to limit exposure
- ▶ Assess the impact of some of the emerging technologies and agricultural practices on environmental health and how they are affecting human health
- ▶ Identify resources for patients and clinicians interested in environmental advocacy



# Study Participants

- 1,198 registered for the study version of the course
- 1,033 completed the informed consent
- 926 completed the pretest measures (89.6%)
- Enrollment - February 1, 2012 – October 31, 2013



# Study Measures

- ▶ Medical knowledge test on course content – 16 items
- ▶ Beliefs and Attitudes:
  - ▶ Perceived seriousness of overall environmental issues (Mobley et al., 2002 - National Geographic/NSF survey).
    - ▶ 16 items rated on 5-point scale from “not at all serious” to “of greatest seriousness”
  - ▶ Attitudes about importance of environmental health (Kilpatrick, 2002)
    - ▶ 4 items rated on 5-point scale
      - ▶ The role of environmental health impacts on patients is... *degree of importance*
      - ▶ Assessing environmental exposures through history-taking is... *degree of importance*
      - ▶ The magnitude of patient's environmental related illnesses is... *degree increasing*
      - ▶ The amount of control that clinicians have over environmental health hazards is... *degree of control*



# Study Measures - continued

- ▶ Attitudes about EH history importance and barriers (Kilpatrick et al., 2002):
  - ▶ Conducting an environmental health history on all my patients would...
    - ▶ 5 items rated on 5-point scale from “strongly disagree” to “strongly agree”
      - ▶ Help them prevent exposures to environmental threats.
      - ▶ Identify the exposures causing specific symptoms.
      - ▶ Add more work for me/my staff.
      - ▶ Takes up too much time.
      - ▶ Create a potential reimbursement problem.
- ▶ Confidence in environmental health skills (Kilpatrick et al., 2002).
  - ▶ 2 items rated on 5-point scale from “not at all confident” to “strongly confident”
    - ▶ In identifying the exposures causing specific symptoms.
    - ▶ In helping patients prevent exposures to environmental threats.
- ▶ Course Evaluation at posttest



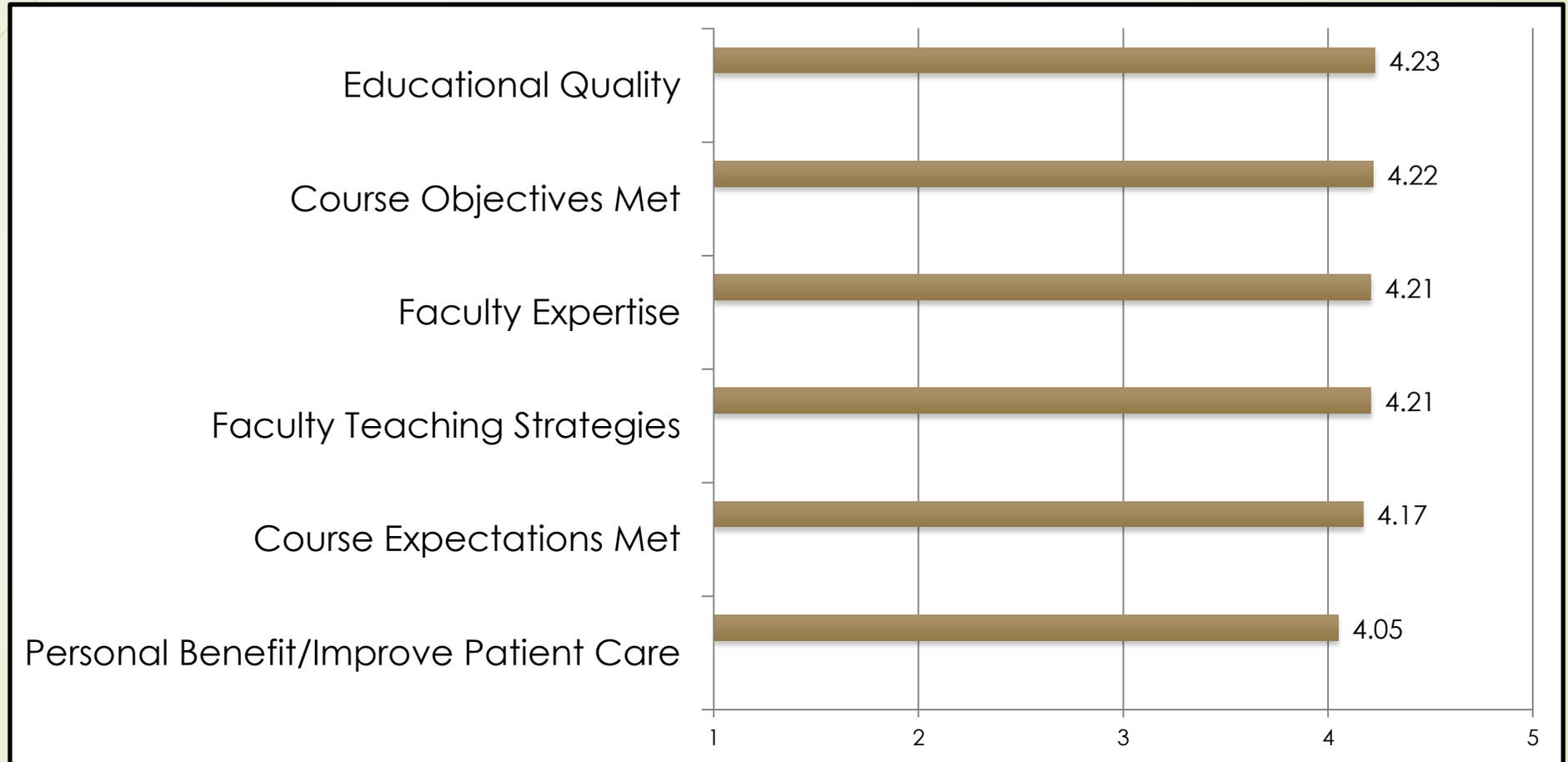
# Sample

- ▶ 80.2% Female (n=740)
- ▶ Average age 44 years old, range 19-80 years old
- ▶ Healthcare Profession
  - ▶ 38.2% Practicing Physicians (n=354)
  - ▶ 35.2% Nursing Professionals (n=326; includes Nurse Practitioners, Physician Assistants)
  - ▶ 16.1% Other (n=151)
  - ▶ 8.1% Fellows, Residents, Medical Students (n=76)
- ▶ Primary Practice Setting
  - ▶ 48.3% Private Practice (n=445)
  - ▶ 21.2% Other (n=195)
  - ▶ 21.1% Hospital (n=194)
  - ▶ 9.4% Community Health Center (n=87)

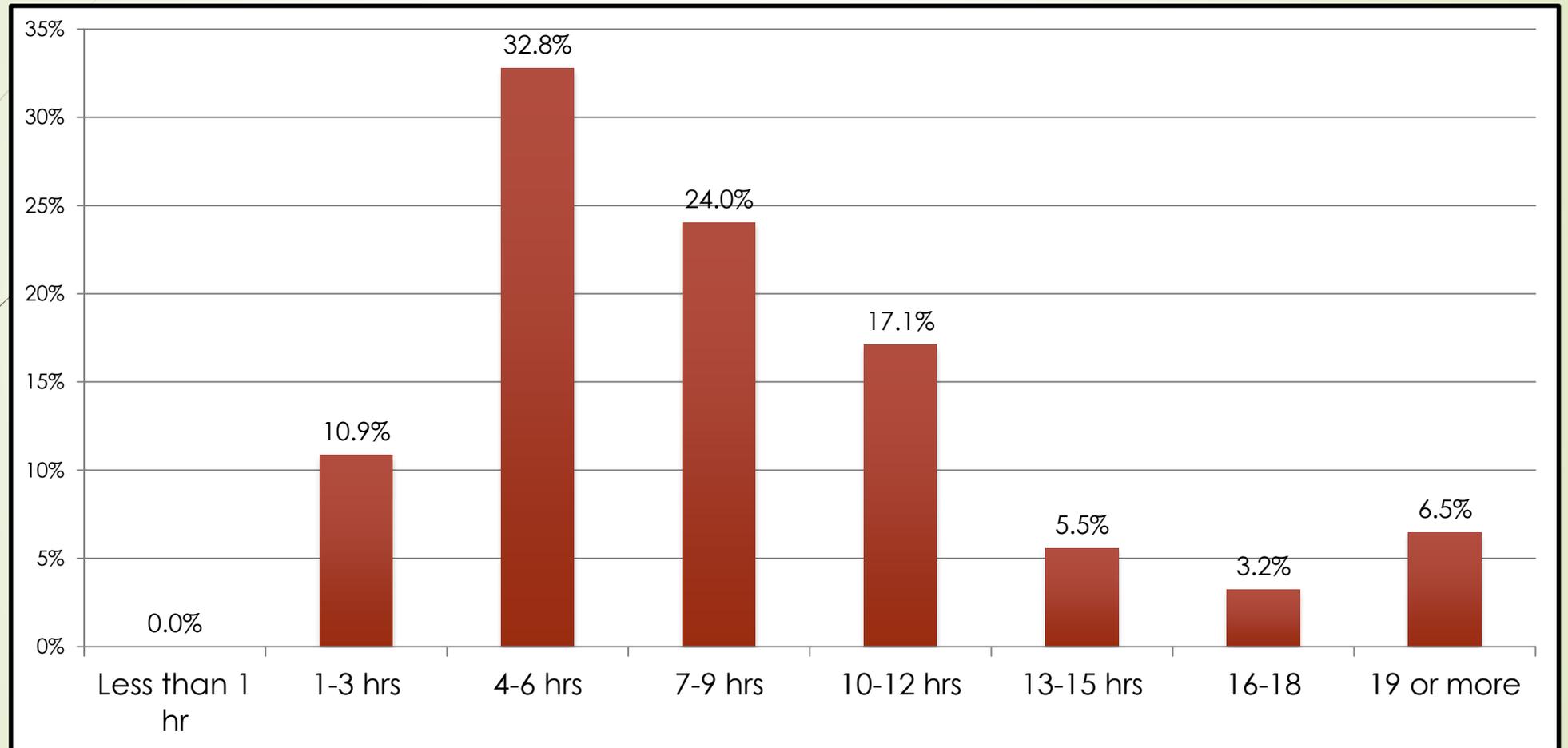
# Course Objectives Met

Item	Mean
Identify several resources for patients and clinicians interested in environmental advocacy.	4.37
Identify vulnerable patient populations in terms of environmental toxin exposures.	4.31
Identify the primary categories of chemical toxins present in the environment, and interpret how their mechanism of actions may impact human health.	4.3
Recognize and identify the range of toxins known to demonstrate endocrine disruptor activity in humans.	4.26
Acquire familiarity with consumer resources that can help individuals reduce unnecessary environmental toxin exposures, and recognize how cultural and socioeconomic status may influence their number of exposures and ability to limit exposure.	4.26
Apply a structured approach to taking an environmental medicine history that includes consideration of potential toxins in air, land, and water.	4.13
Appraise the emerging research links between environmental toxins and the documented rise of complex chronic illness; such as obesity, metabolic syndrome, cancers, neurodevelopmental disorders and reproductive health, and identify how an integrative medicine model may be applied in both prevention and treatment.	4.08
Assess the impact of some of the emerging technologies and agricultural practices on environmental medicine and how they are affecting human health.	4.06

# Course Evaluation Components



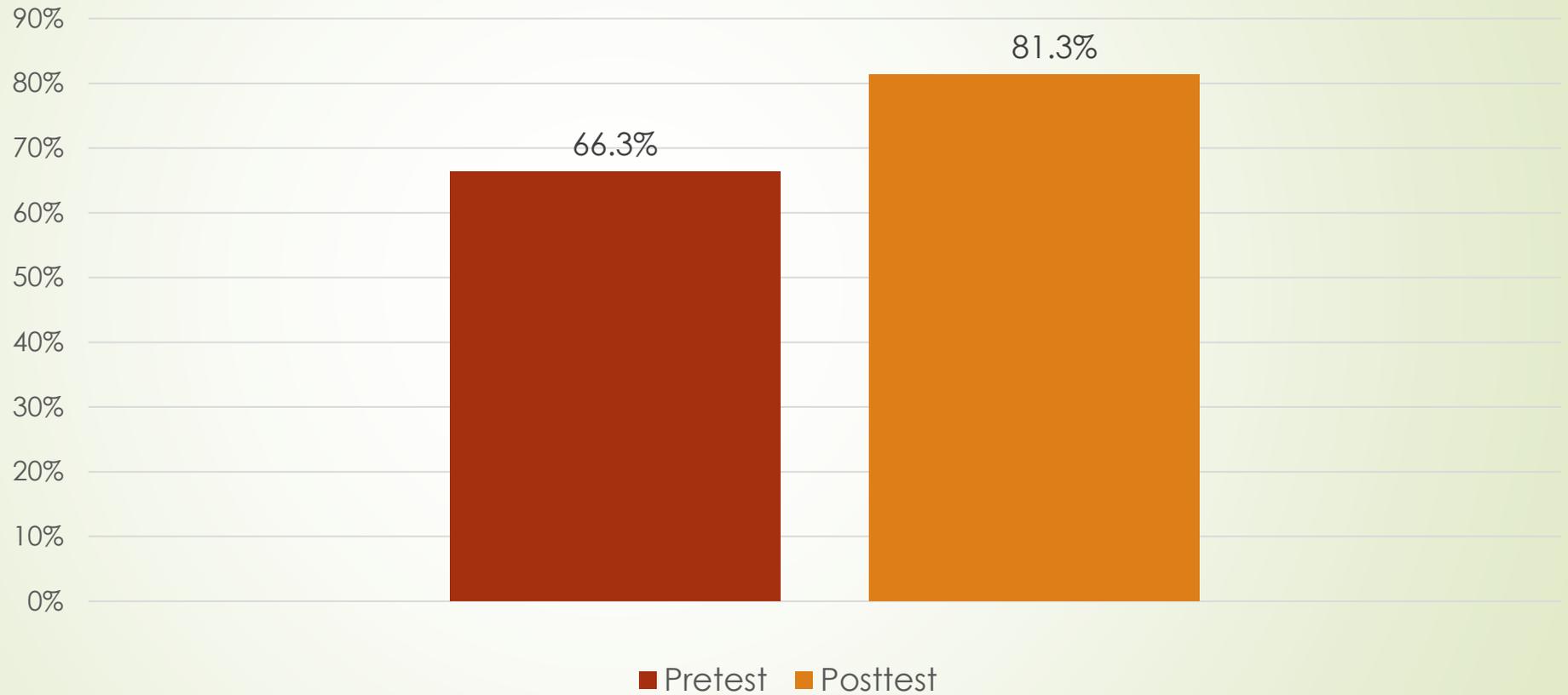
# Course Completion Time



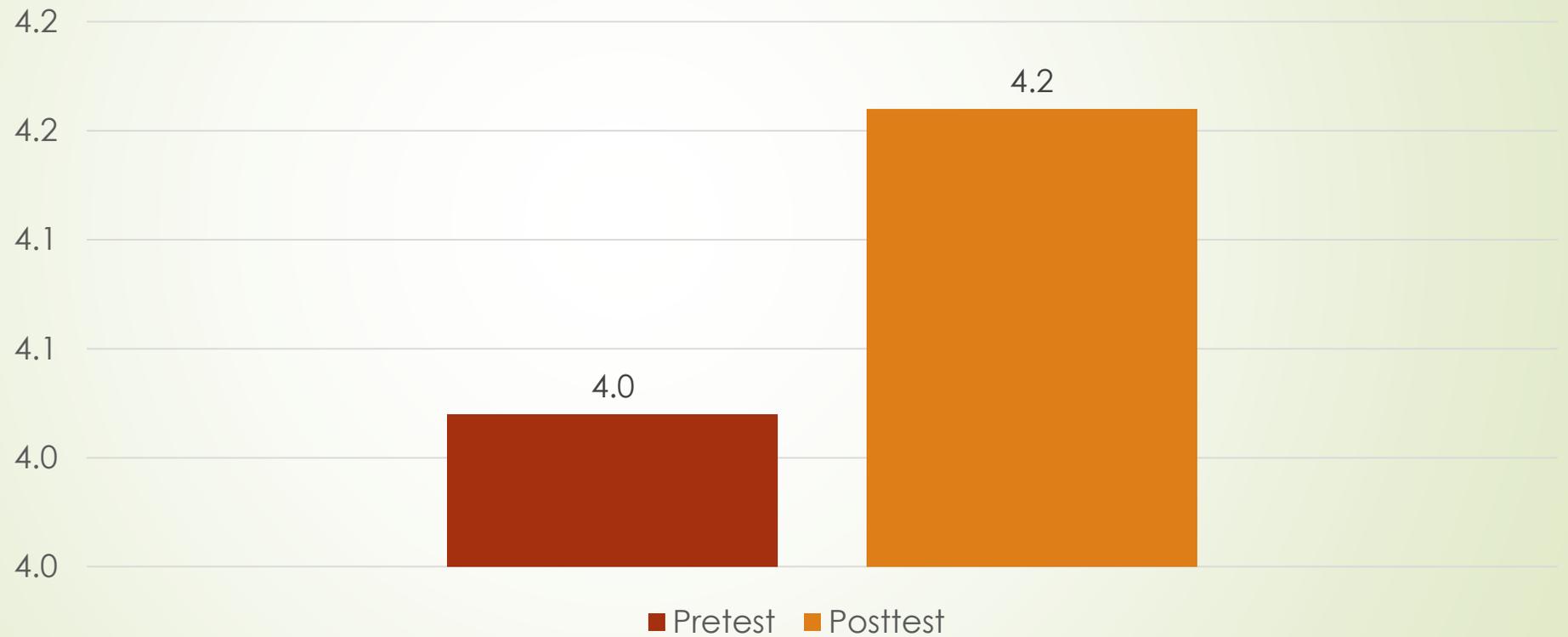


# Pre-post Changes

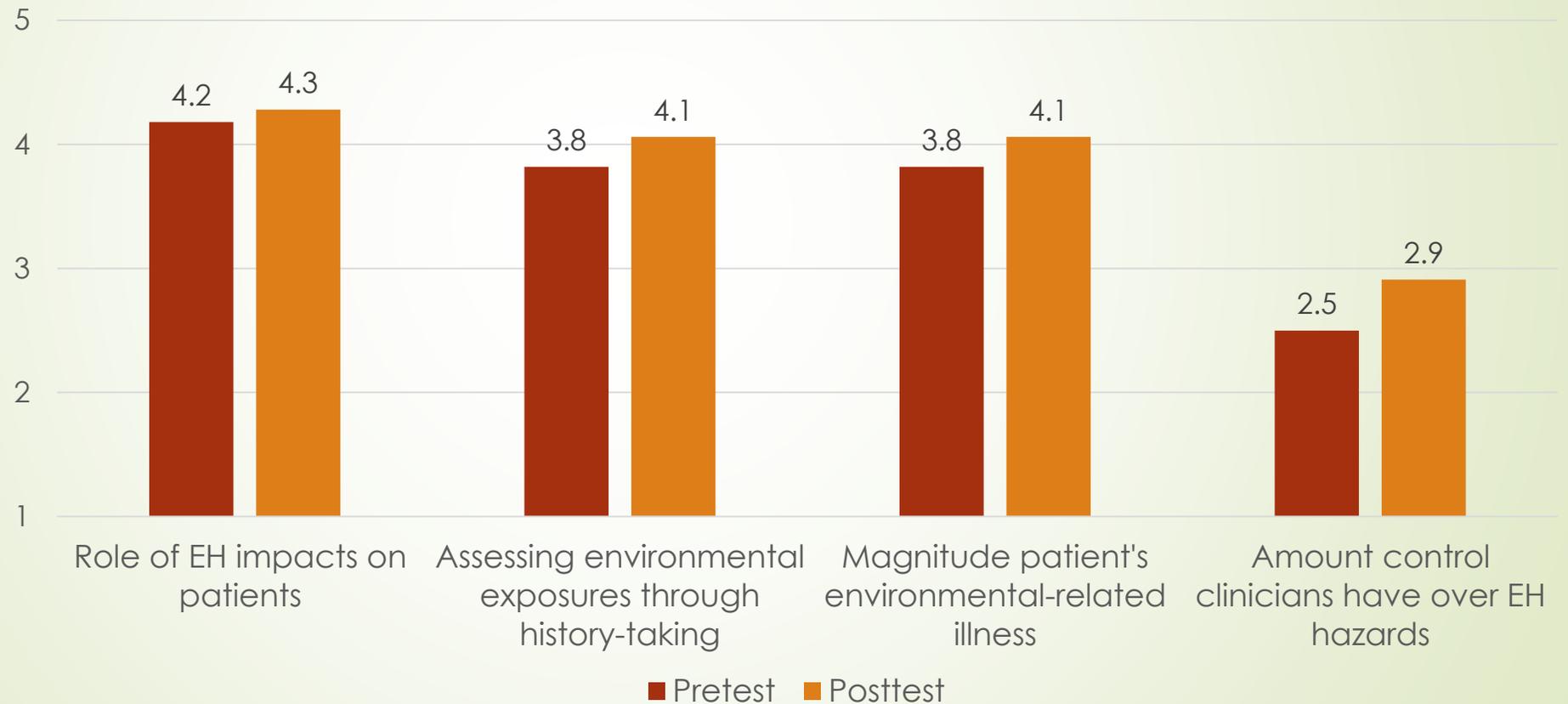
# Medical Knowledge - $p < 0.001$



# Environmental Concern - $p < 0.001$



# Belief about Importance of Environmental Health - $p=0.001$



# Belief about Conducting Environmental Health History - $p < 0.007$



# Confidence in Conducting Environmental Health History – $p < 0.001$





Do the improvements  
continue over time (30-  
day follow-up)?



# Improvements Maintained at Follow-up

- ▶ Medical Knowledge
- ▶ Environmental Concern
- ▶ Attitudes about importance of environmental health
  - ▶ Assessing environmental exposures through history-taking
  - ▶ Magnitude of patient's environmental-related illness
- ▶ Attitudes about importance of EH history
  - ▶ Help them prevent exposure to environmental threats
  - ▶ Identify exposures causing specific symptoms
- ▶ Confidence in environmental health skills
  - ▶ In identifying the exposures causing specific symptoms
  - ▶ In helping patients prevent exposures to environmental threats



# Improvements at Posttest & Follow-up

- ▶ Attitudes about importance of environmental health
  - ▶ The amount of control that clinicians have over environmental health hazards
- ▶ Attitudes about EH history
  - ▶ Adding more work for me/my staff



# Returned to Baseline at Follow-up

- Attitudes about importance of environmental health
  - The role of environmental health impacts on patients
- Attitudes about EH history
  - Takes up too much time
  - Create a potential reimbursement problem



# Limitations:

- Attitudes, knowledge and confidence were assessed but no measure of how the course content was applied in clinical practice was utilized
  - Next step:
    - Explore impact on patient populations of health care professionals who take the course
- 



# Summary

- ▶ Participation in an online Environmental Health Course significantly improved:
  - ▶ Medical knowledge
  - ▶ Environmental concern
  - ▶ Attitudes about importance of environmental health
  - ▶ Attitudes about importance of taking an environmental health history
  - ▶ Attitudes about barriers to taking an environmental health history
  - ▶ Confidence in conducting an environmental health history
- ▶ Most changes were maintained or improved more at follow-up
- ▶ Initial improvements were lost at follow-up for:
  - ▶ 2 barriers (time, reimbursement) to taking an environmental health history
  - ▶ Role of environmental health impacts on patients