



USE OF AIR QUALITY INFORMATION AS A HEALTH RISK REDUCTION STRATEGY

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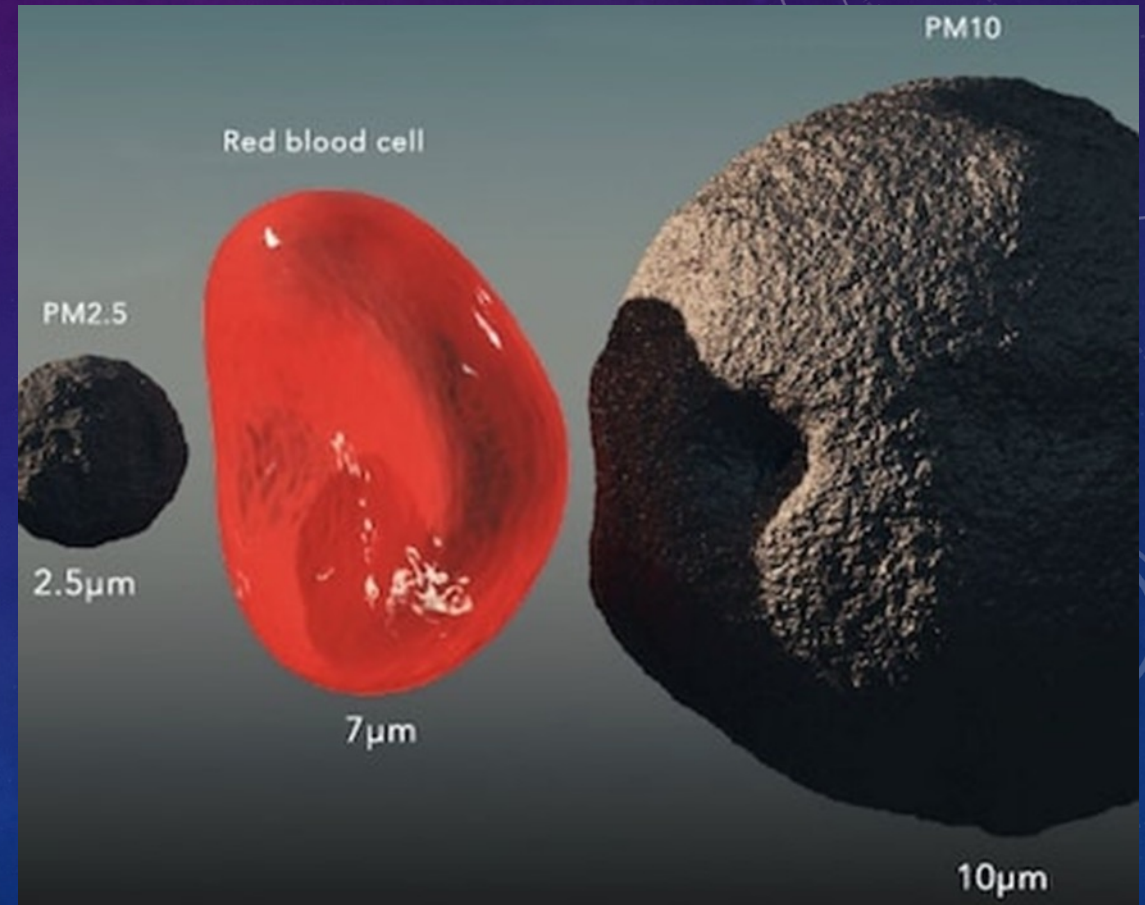
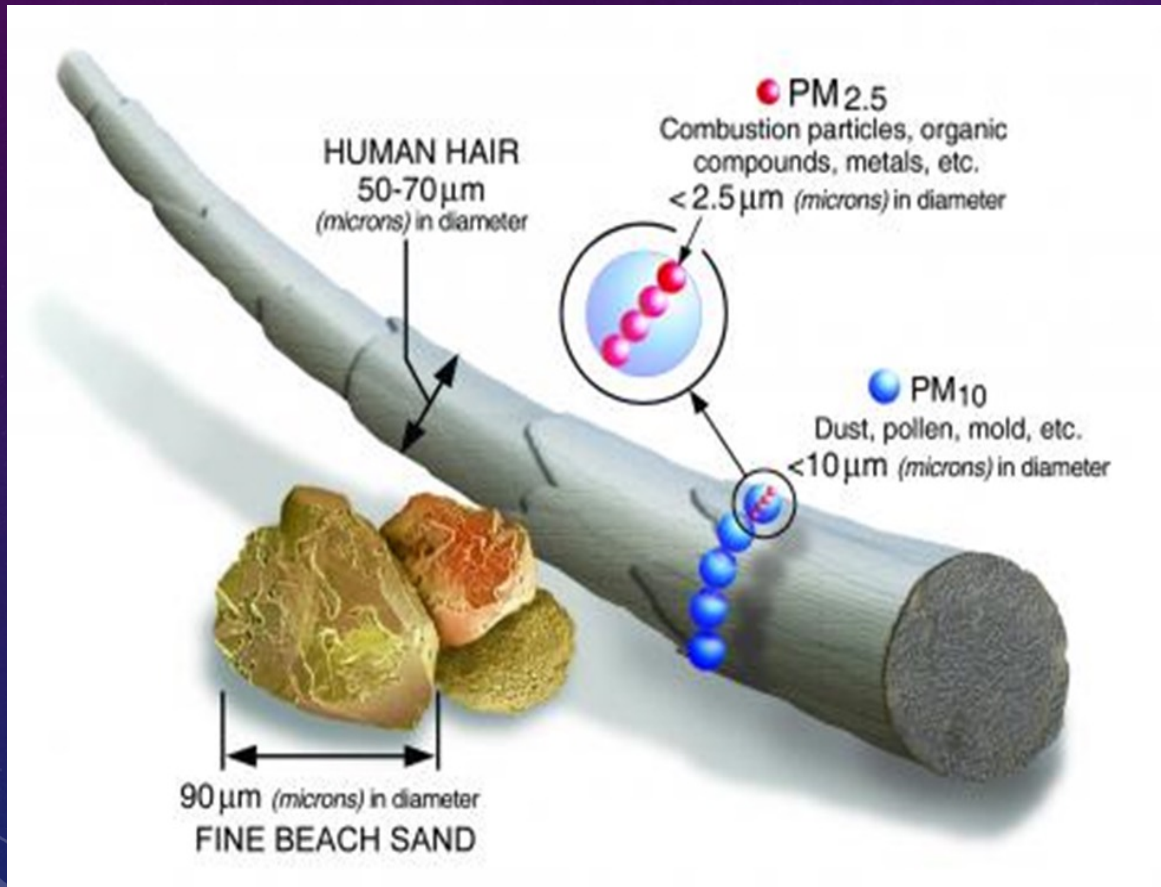
OBJECTIVES

- After participation in this educational session the participant will:
 - Describe the effect of particulate matter (PM_{2.5}) on health
 - Review the findings of a research study on the effect of an educational module on air quality as a health risk reduction strategy.
 - Verbalize steps that the participant can take to reduce exposure to air pollution both indoors and outdoors
 - Personalize teaching points that can be utilized when teaching patients to avoid exposure to air pollution as a health risk reduction strategy.

RECENT RESEARCH

- Studies in the United States have reported the relationship between the exposure to PM2.5 pollution and:
 - Physical distress, cardiac disease, myocardial infarction, stroke, low birth weight, intra-uterine growth restriction, insulin resistance, asthma and respiratory disease progression, endometriosis, emotional anxiety and depression, otitis media, poor academic performance, autism, Parkinson's disease, migraines, and increased risk of premature death by illness or suicide.

FINE PARTICULATE MATTER (PM2.5)



AIR QUALITY INDEX

Air Quality Index	Who Needs to be Concerned?	What Should I Do?
Good 0-50	It's a great day to be active outside.	
Moderate 51-100	Some people who may be unusually sensitive to particle pollution.	<p>Unusually sensitive people: Consider reducing prolonged or heavy exertion. Watch for symptoms such as coughing or shortness of breath. These are signs to take it easier.</p> <p>Everyone else: It's a good day to be active outside.</p>
Unhealthy for Sensitive Groups 101-150	Sensitive groups include people with heart or lung disease, older adults, children and teenagers.	<p>Sensitive groups: Reduce prolonged or heavy exertion. It's OK to be active outside, but take more breaks and do less intense activities. Watch for symptoms such as coughing or shortness of breath.</p> <p>People with asthma: should follow their asthma action plans and keep quick relief medicine handy.</p> <p>If you have heart disease: Symptoms such as palpitations, shortness of breath, or unusual fatigue may indicate a serious problem. If you have any of these, contact your health care provider.</p>
Unhealthy 151 to 200	Everyone	<p>Sensitive groups: Avoid prolonged or heavy exertion. Move activities indoors or reschedule to a time when the air quality is better.</p> <p>Everyone else: Reduce prolonged or heavy exertion. Take more breaks during all outdoor activities.</p>
Very Unhealthy 201-300	Everyone	<p>Sensitive groups: Avoid all physical activity outdoors. Move activities indoors or reschedule to a time when air quality is better.</p> <p>Everyone else: Avoid prolonged or heavy exertion. Consider moving activities indoors or rescheduling to a time when air quality is better.</p>
Hazardous 301-500	Everyone	<p>Everyone: Avoid all physical activity outdoors.</p> <p>Sensitive groups: Remain indoors and keep activity levels low. Follow tips for keeping particle levels low indoors.</p>

HEALTH EFFECTS OF PM2.5

- The higher the level of pollutants, the higher the risk of morbidity and mortality from exposure - specifically particulate matter smaller than 2.5 micrometers (PM2.5).
- A decrease in mortality is related to a reduction in PM2.5 exposure over extended periods.
- **Effects are reversible when exposure is decreased over time.**

PRESENCE OF PM2.5

- PM2.5 in indoor air pollution
 - High heat cooking
 - Gas stove use
- PM2.5 in outdoor air
 - diesel engine exhaust
 - coal fired power plants
 - wildfire smoke

RESEARCH STUDY DESIGN

- Explanatory research study involving one group of participants
- **Quantitative data collection:**
 - Demographic information
 - Home Air Quality Assessment,
 - Pre-test and post-test administered before and after educational program.
 - Daily Health Diary
- **Qualitative data collection:**
 - One month after education

SAMPLE/SETTING/STUDY PARTICIPANT RECRUITMENT

- Sample: 37* participants
- Setting: Entire study conducted remotely via the Internet
- Recruitment: Participants were recruited using a social media announcement

RESULTS: RESEARCH QUESTION I

- **How did study participants utilize knowledge about air quality and change their behavior after an educational program to avoid exposure to ambient and indoor air pollution?**
 - Pre-Test/Post-Test results were significant indicating a change in knowledge - $t(37) = -8.49, p < .001$.
 - Answers when AQI was elevated: "Was planning on spending time outdoors but will focus on indoor activities," "waited for the AQI to go down before I took a walk outside."
 - When AQI was low: responses were "played golf," and "took a longer walk."

RESULTS: RESEARCH QUESTION II

- **What steps did the participants take to reduce exposure to PM2.5 and indoor air pollution after an educational program on AQI?**
- Participants used the AQI information to guide their outdoor plans
- Also:
 - opened windows
 - ran air purifier
 - turned on vent hood while cooking/opened windows while cooking
 - closed windows
 - turned on air conditioning

RESULTS: RESEARCH QUESTION III

- **How frequently did the participants access and use the AQI and air pollution exposure reduction strategies?**
- 36 people remained in the study for one month.
- Mean of 26 responses per person.
- Participants reported applying varying strategies to decrease exposure to air pollution, including changing their furnace filters, moving a 3-D printer, and taking advantage of low AQI values to spend longer time outdoors.

QUALITATIVE THEMES

Themes	Subthemes
Facilitated Curiosity	<ul style="list-style-type: none">• People questioned the information• Frequently checked the AQI• Desired confirmation• Developed awareness.
Shared Information with Others	<ul style="list-style-type: none">• Created conversations• Used knowledge of AQI
Took Action Based on AQI	<ul style="list-style-type: none">• Used AQI information to become active• Recognized importance of AQI• Applied information to their daily lives

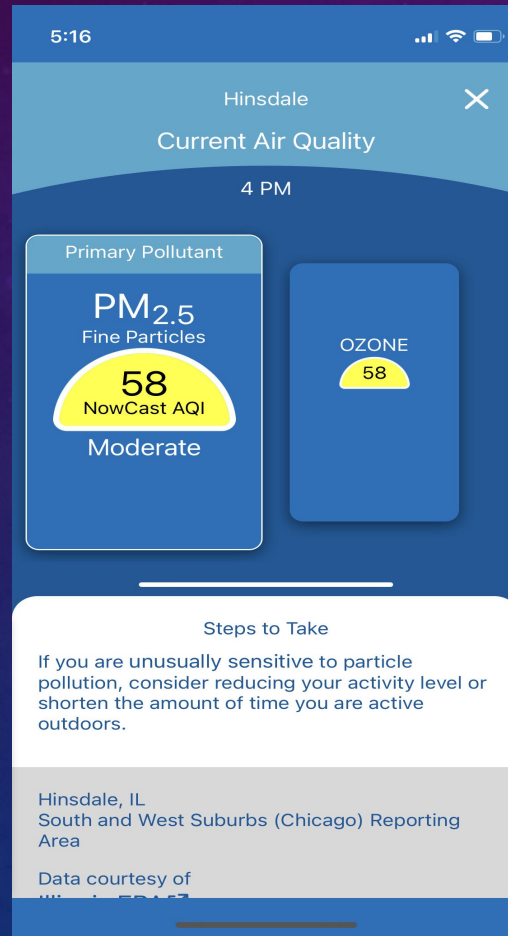
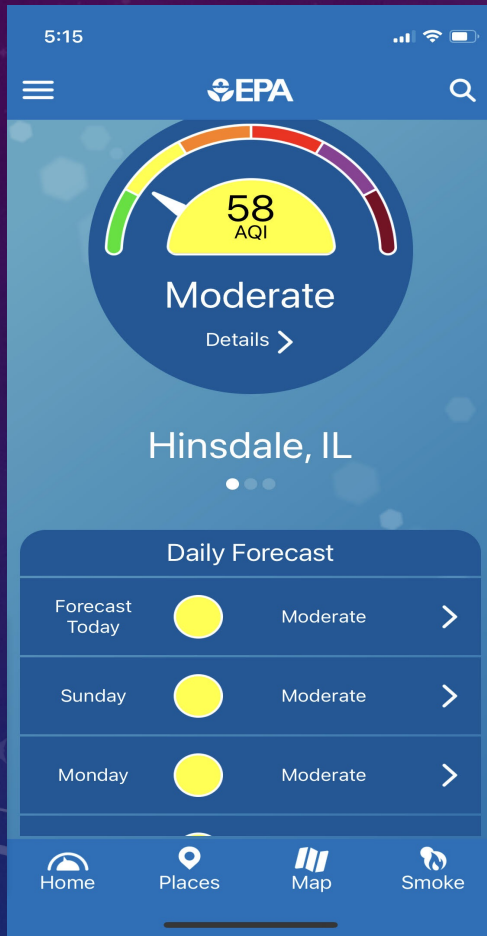
STUDY LIMITATIONS

- Demographic makeup:
 - 30 Females, 7 Males
 - Ethnicities: White and Asian only
- Pre-Test and Post-Test were created for the study
- Study design of one group
- Limited means to measure AQI in the home

IMPLICATIONS FOR NURSING PRACTICE

- Nurses must incorporate air quality information into their daily care of patients.
- Help the patient understand the information and use it as a resource including toxicants in air pollution, both indoors and outdoors, interpret AQI, and then interpret the informational resources available.
- Health care practitioners need to offer clear, personalized environmental advice to be integrated into the individual's care plan.

NOW, PROTECT YOURSELF!



- Use an app to measure air quality before exercising outdoors.
- Wait for AQI to improve or wear an N-95 mask during outdoor activities.
- Open a window or use exhaust system when using high heat cooking.

FINAL THOUGHTS

- Teach others about the invisible nature of fine particulate matter.
- Demonstrate how to consult an air quality/weather app to measure air quality before exercising outdoors and review safe level readings compared to elevated levels.
- Review necessary precautions to protect themselves.
- Wait for AQI to improve or wear an N-95 mask during outdoor activities.
- Open a window when using high heat cooking.
- Monitor weather trends and reconsider travel to places with elevated AQI levels

AIR POLLUTION IS TRANSBOUNDARY

- It is a health equity issue because it affects all of us

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