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Parent Health Literacy and Environmental Health-Related Perceptions of Risk and Motivation to Take Action

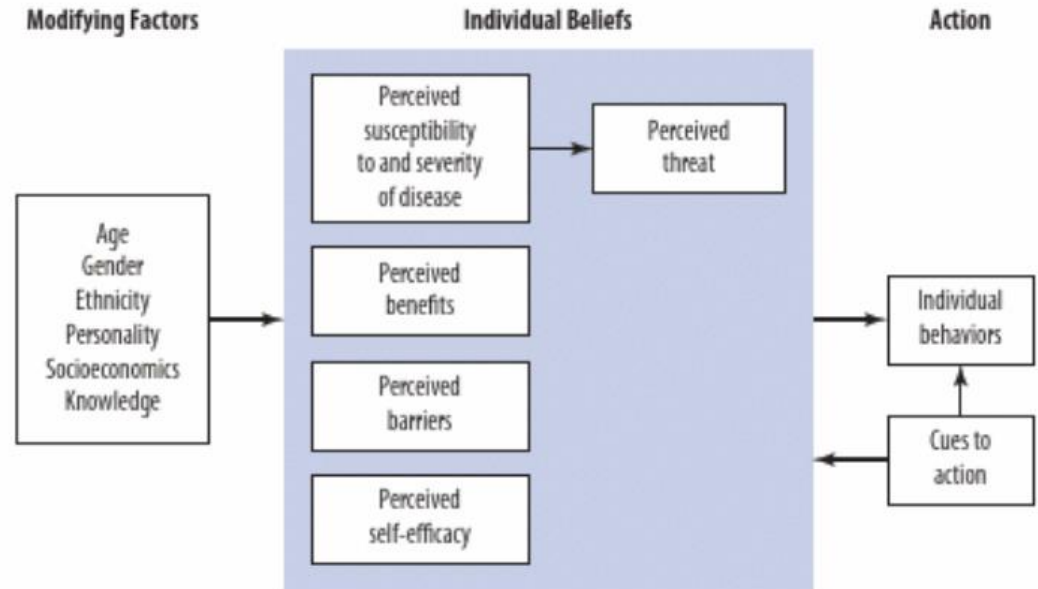
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Disclosure

- My co-authors and I document that we have no relevant financial relationships to disclose or COIs to resolve

Health Literacy and Outcomes

- Limited parent health literacy associated with
 - Adverse child health outcomes
 - Parent knowledge and behaviors
- Mechanisms for associations aligned with Health Belief Model



Health Literacy and Environmental Health

- Emerging research on environmental health literacy (Finn 2017)
 - Promoting environmental health education (Davis 2018; Laveaux 2018)
 - Design/application of scales (Irvin 2019; Lichtveld 2019)
 - Associations between health literacy and environmental knowledge outside the US (Carducci 2019; Bogar 2017)
- Limited study of health literacy in context of environmental health-related perceptions of risk and motivation to take action in parents

Objective

- Examine associations between parent health literacy and environmental health-related
 - Perception of risk
 - Motivation to take action

Methods: Study Design and Subjects

- Cross-sectional study
- 2 sites
 - Urban public hospital clinic
 - Private hospital-affiliated subspecialty ambulatory site
- Consecutive enrollment of parents of children
- Inclusion Criteria: English or Spanish-speaking
- Survey
 - Piloted to ensure understandability
 - Administered in preferred language

Outcome: Perceived Risk (Worry)

- We would like to know what you think about **how safe the food your child eats is**. How worried are you about...
 - Pesticides
 - Plastic containers
 - Added preservatives
 - Genetically modified organisms
 - Radiation
- **Likert Scale** (not at all worried, a little worried, somewhat worried, very worried)
- Dichotomized to very worried vs. other responses

Outcome: Perceived Risk (Worry)

- We would like to know what you think about **how safe the food your child eats is**. How worried are you about...
 - Pesticides
 - These are poisons that are used to kill bugs which can get into food
 - Plastic containers
 - Added preservatives
 - Genetically modified organisms
 - Radiation
- **Likert Scale** (not at all worried, a little worried, somewhat worried, very worried)
- Dichotomized to very worried vs. other responses

Outcome: Perceived Risk (Worry)

- We would like to know what you think about the following **in the environment inside and outside of where your child lives, plays, and goes to school**. How worried are you about...
 - Overall
 - Smoking
 - Mold
 - Cleaning products
 - Natural gas
 - Carbon monoxide
 - Heavy metals
 - Construction materials
 - Aerosols and propellants
 - Air pollution
- **Likert Scale** (not at all worried, a little worried, somewhat worried, very worried)
- Dichotomized to very worried vs. other responses

Outcome: Perceived Risk (Health Problems Caused by Environment)

- Based on what you know, how often are these **problems in children caused by chemicals in the environment?**
 - Breathing problems
 - Being born too early
 - Problems with brain, development, or learning
 - Skin problems
 - Cancer
 - Poisonings
 - Problems with hormones (e.g., diabetes)
 - Problems with genes
 - Nutrition problems (e.g., being overweight)
- Likert scale (never, sometimes, often; don't know)
- Dichotomized to never/don't know vs. sometimes/often

Outcome: Motivation to Take Action

- Which of the following things would you do to decrease the amount of toxins your family sees, or is exposed to? (Yes/No)
 - Buy special products (e.g., organic)
 - Spend more on groceries
 - Decrease the amount of fish your family eats
 - Use cold water for cooking
 - Not leave car running when parked
 - Use the car less
 - Put a carbon monoxide alarm in your house
 - Call water company to get report on water testing
 - Use kit to test home (e.g., lead, mold)
 - Wipe off toys, doorknobs

Predictor: Parent Health Literacy

- Newest Vital Sign (score out of 6)
 - Low: 0 to 1
 - Marginal: 2 to 3
 - Adequate: 4 to 6

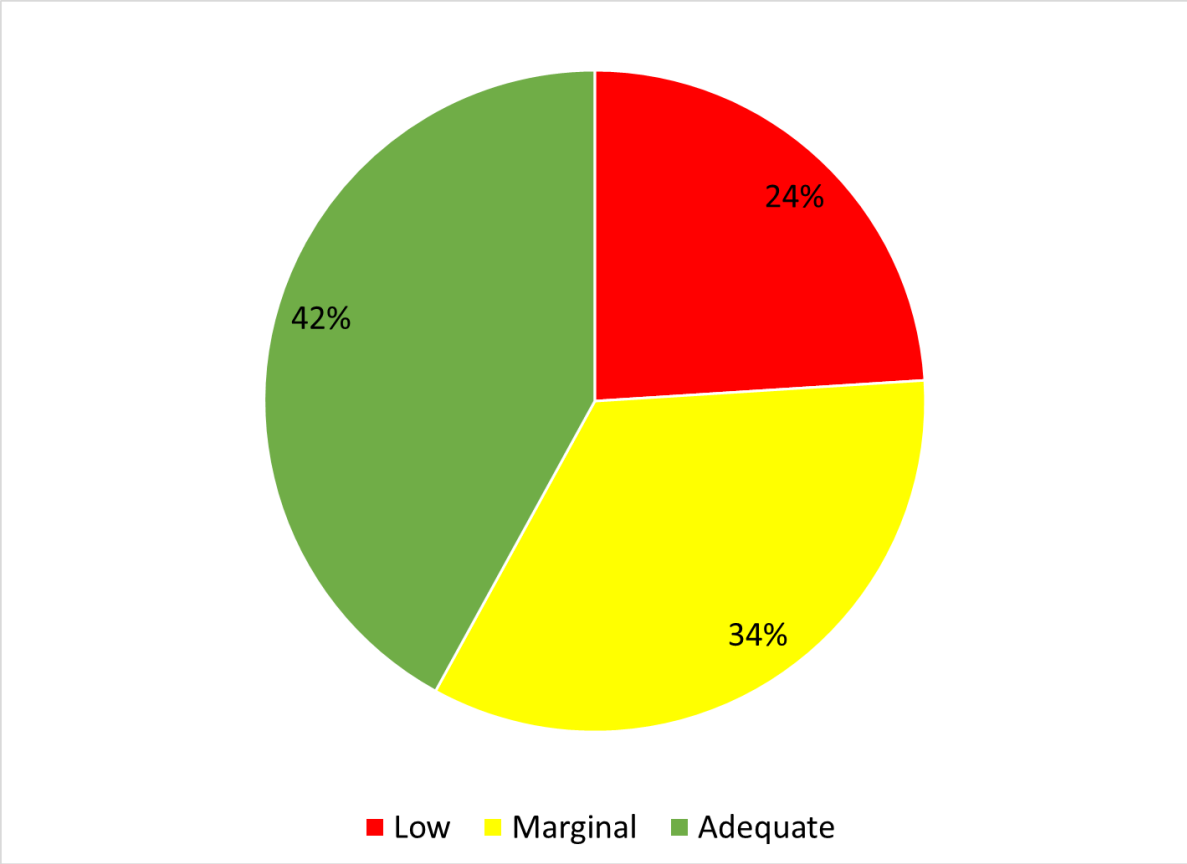
Analysis

- Outcome
 - Perceived risk – worry
 - Perceived risk – health problem caused by environment
 - Motivation to take action
- Predictor: Parent health literacy
- Bivariate analysis: Chi square tests
- Multivariable analysis
 - Multiple logistic regressions using GEE
 - Adjusting for child age, chronic disease, insurance type; parent age, race/ethnicity, language, education; site

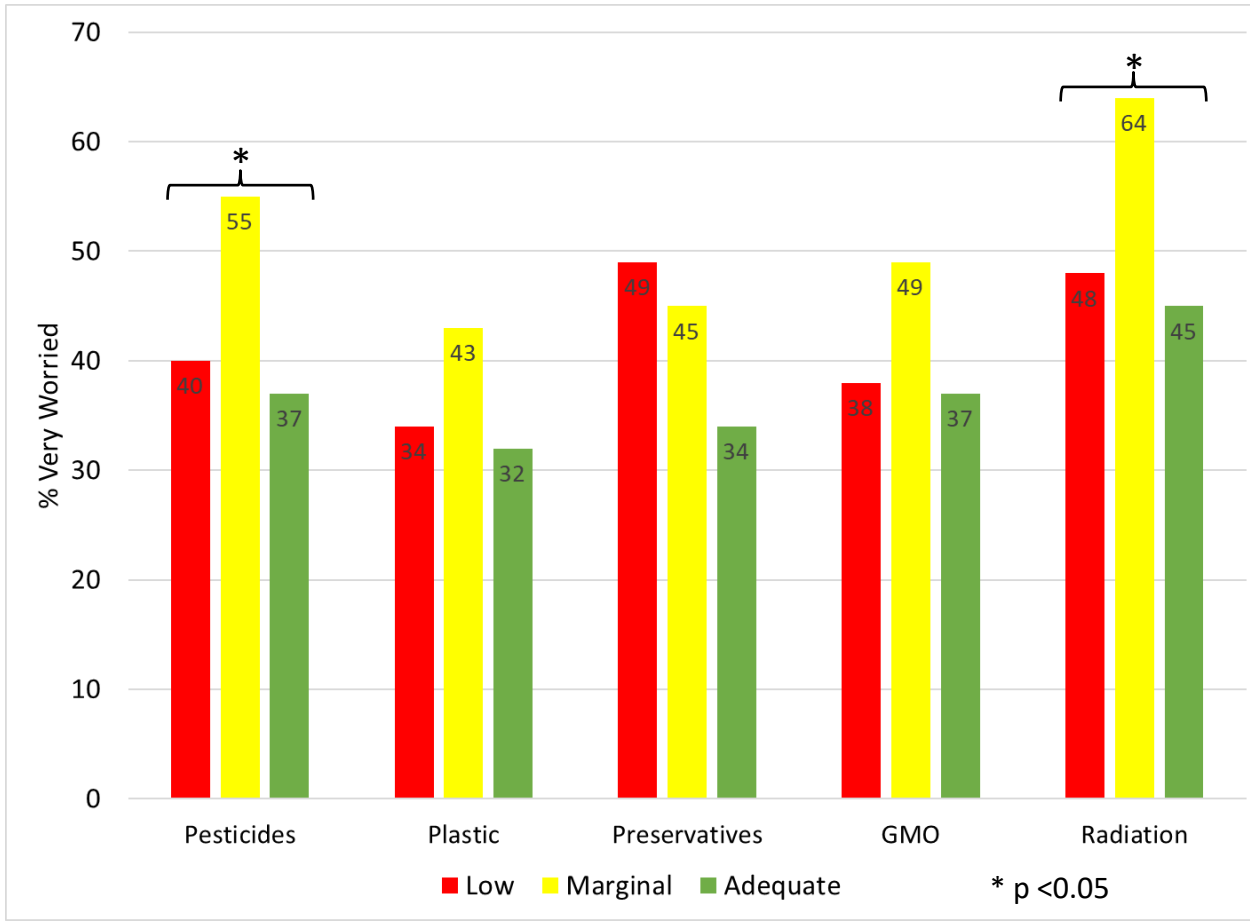
Parent / Patient Characteristics (n=300)

| Variable | % |
|-----------------------------------|----|
| Mother | 82 |
| Race/ethnicity | |
| Latinx | 51 |
| Non-Hispanic Black | 12 |
| Non-Hispanic White | 26 |
| Medicaid | 67 |
| Child with chronic disease | 34 |
| Public hospital clinic | 54 |

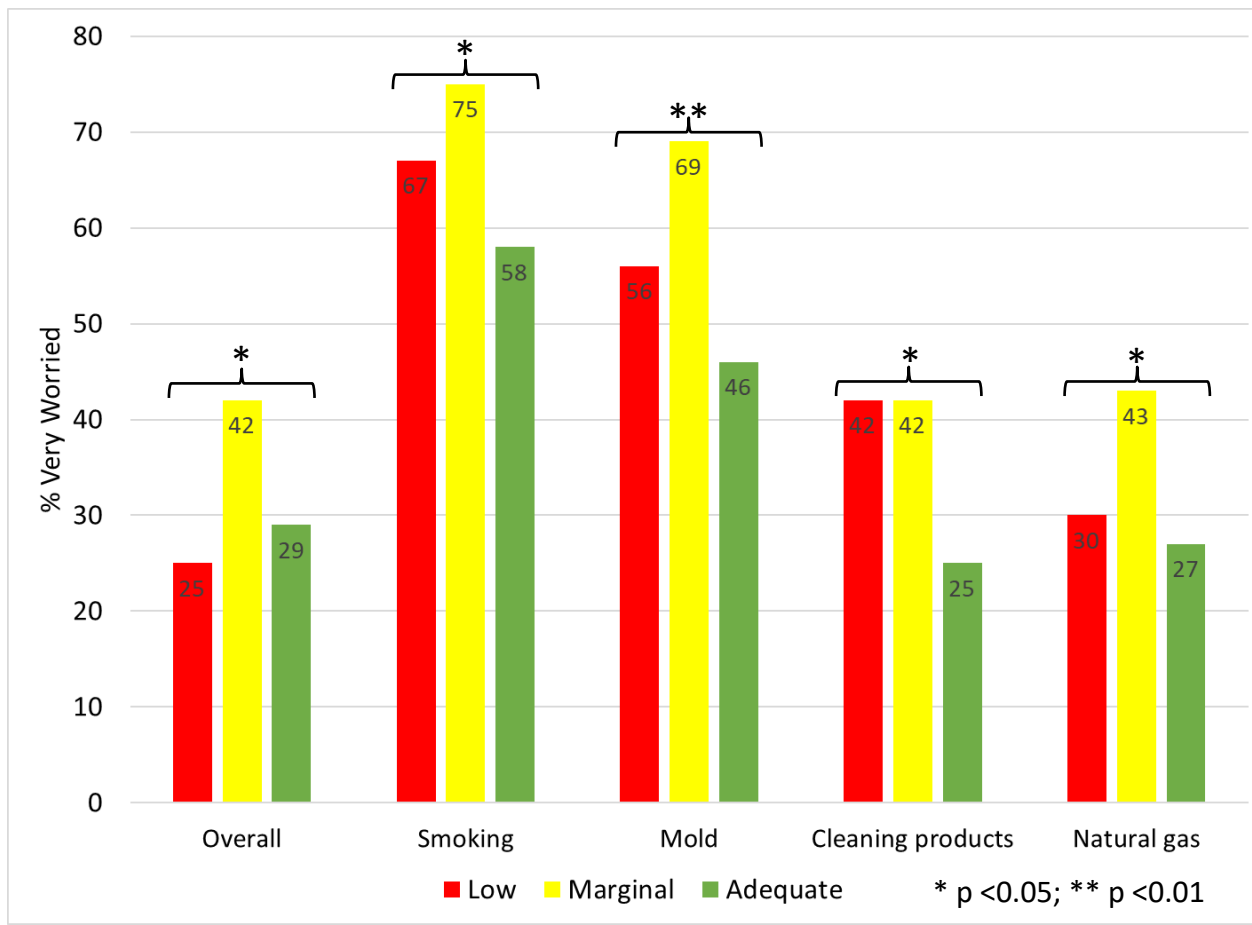
Parent Health Literacy



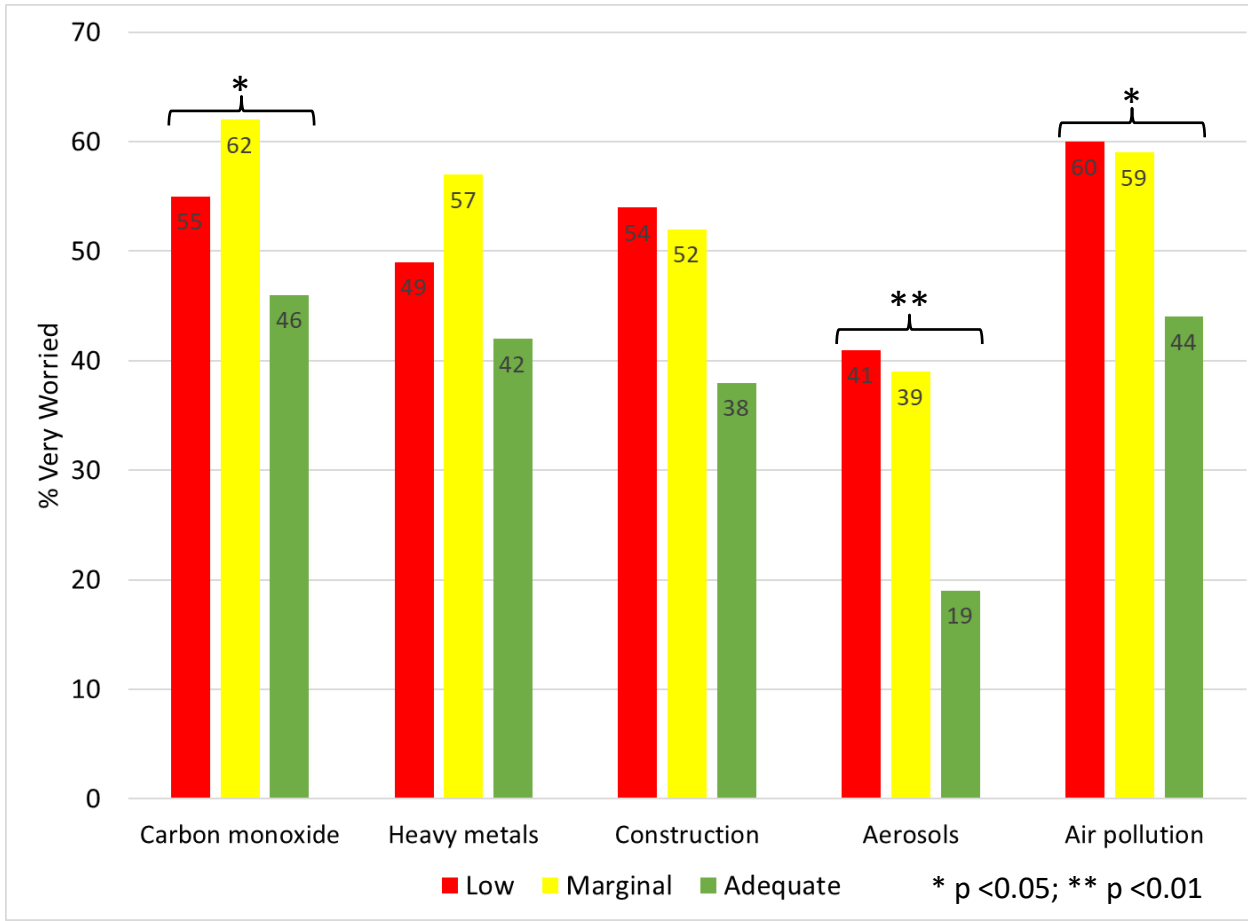
Perceived Risk – % Very Worried About Safety of Food Child Eats



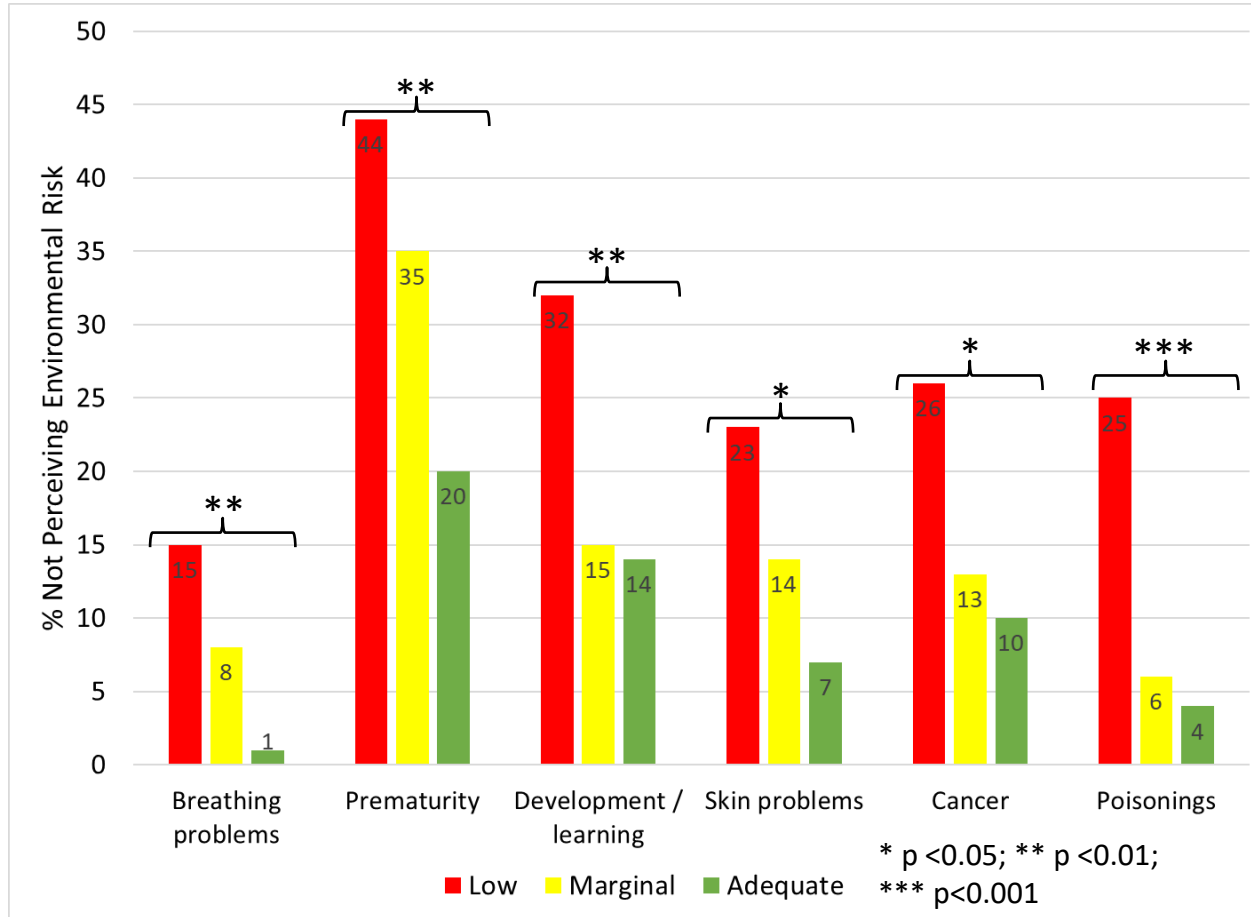
Perceived Risk – % Very Worried About Environment



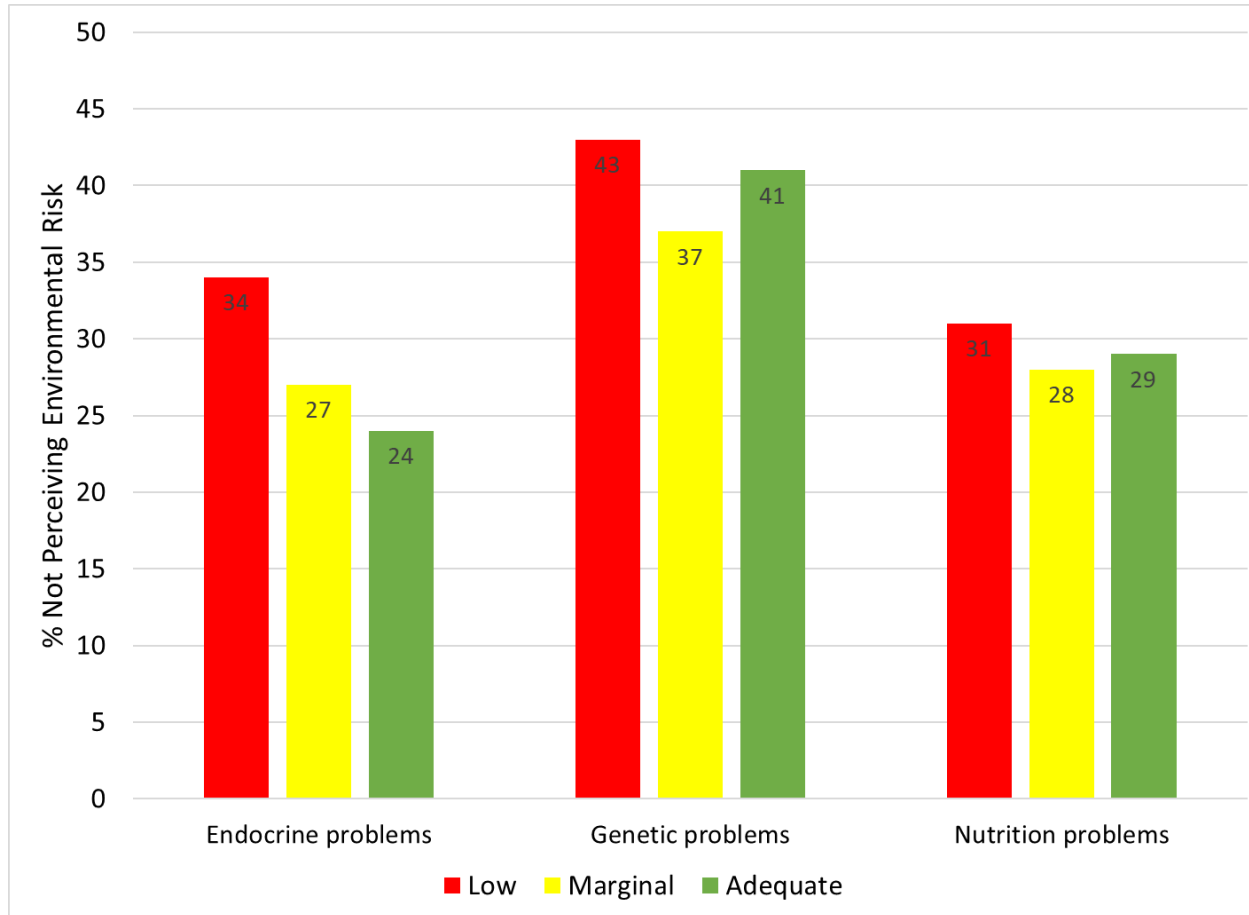
Perceived Risk – % Very Worried About Environment



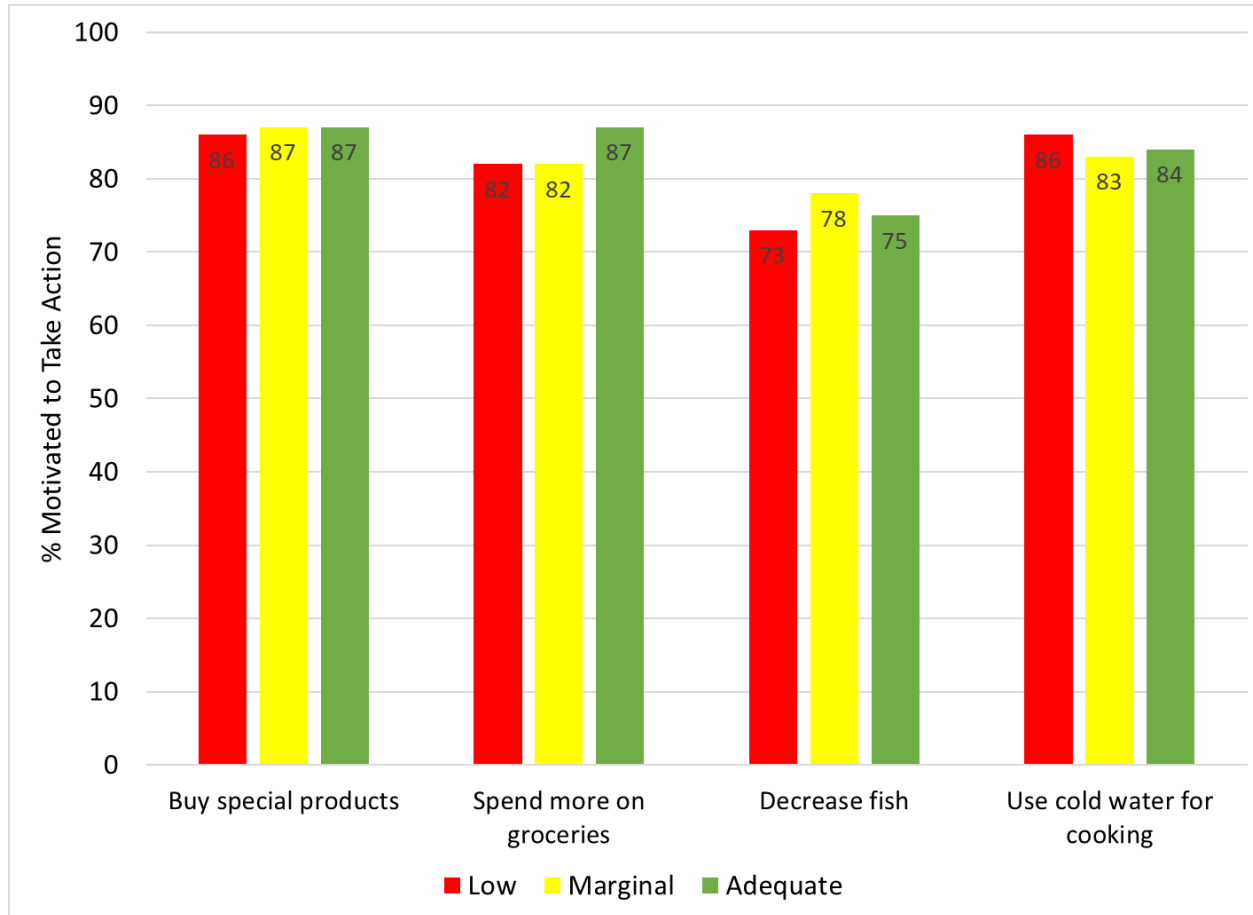
Perceived Risk – % Not Perceiving Environmental Risk of Problem



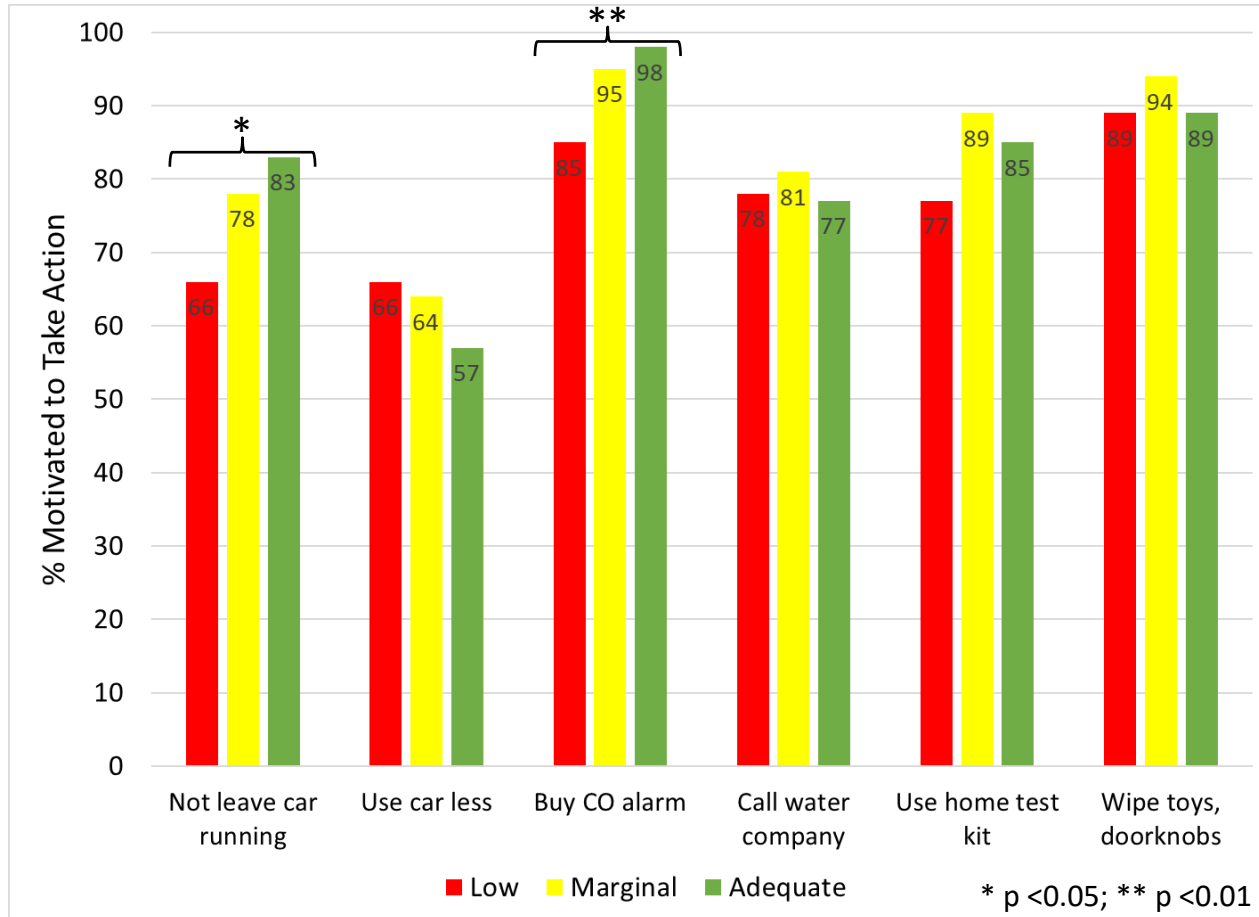
Perceived Risk – % Not Perceiving Environmental Risk of Problem



% Motivated to Take Action



% Motivated to Take Action



Adjusted Analyses

| Health Literacy Level (Reference: Adequate) | aOR (95% CI) [†] | | |
|--|--|---|---|
| | Perceived Risk: Very Worried (n=284) | Perceived Risk: Do not Perceive Environment Contributes to Problem (n=283) | Motivation to Take Action: None (n=285) |
| Low | 1.4 (0.7 – 2.7) | 1.9 (1.1 – 3.3) * | 1.4 (1.0 – 2.2) |
| Marginal | 1.7 (0.9 – 3.0) | 1.5 (0.9 – 2.4) | 1.3 (0.9 – 1.9) |

† Other covariates included in model: Child age, chronic disease, insurance type; parent age, race/ethnicity, language, education; site

*p<0.05

Adjusted Analyses

| Health Literacy Level (Reference: Adequate) | aOR (95% CI) [†] | | |
|--|--|---|---|
| | Perceived Risk: Very Worried (n=284) | Perceived Risk: Do not Perceive Environment Contributes to Problem (n=283) | Motivation to Take Action: None (n=285) |
| Low | 1.4 (0.7 – 2.7) | 1.9 (1.1 – 3.3) * | 1.4 (1.0 – 2.2) |
| Marginal | 1.7 (0.9 – 3.0) | 1.5 (0.9 – 2.4) | 1.3 (0.9 – 1.9) |

† Other covariates included in model: Child age, chronic disease, insurance type; parent age, race/ethnicity, language, education; site

*p<0.05

Conclusions

- Parents with low health literacy perceive environmental health risks less frequently
- Parents share similar levels of worry and motivation to take action regardless of health literacy

Limitations

- Self-report
- English and Spanish-speaking parents only
- May be underpowered to detect differences

Next Steps

- Explore interrelationships perception of risk and action
- Design health literacy-informed interventions to help parents take action

Acknowledgements

- Howard Trachtman, MD; Leonardo Trasande, MD, MPP; Benard Dreyer, MD; Alan L. Mendelsohn, MD; Jessica J. Velazquez, MPH; Laura Jane Pehrson, RN, BSN; H. Shonna Yin, MD, MS
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Thank you!

Questions?

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Worry – Full Question / Answers

- We would like to know what you think about **how safe the food your child eats is**. How worried are you about each of the following things?
 - Pesticides (these are poisons that are used to kill bugs which can get into food)
 - Plastic containers (chemicals that are in the plastic and can get into food)
 - Added preservatives and artificial flavoring (things that are put into food to make them last longer or taste better)
 - Genetically modified organisms (GMO's) (food made with an animal or plant that had their genes, or DNA, changed. This may be done to help the animal or plant be stronger or live longer)
 - Radiation (when waves of energy are used on food to kill off bacteria that can make people sick)

Worry – Full Question / Answers

- We would like to know what you think about the following **in the environment inside and outside of where your child lives, plays, and goes to school**. How worried are you about...
 - Overall
 - Smoking (for example, from cigarettes or cigars)
 - Mold (things that grow on food or places that are left damp or wet)
 - Cleaning products (chemicals used for home cleaning)
 - Natural gas (gas that is used for cooking or for heating a house)
 - Carbon monoxide (gas that has no odor and that is made from burning fuel, like from a gas stove or from a car)
 - Heavy metals (for example, cadmium, mercury, or lead, that can be found in air, water, soil, and food)
 - Construction materials (for example, asbestos or dust that gets into the air when a building is being torn down or being built)
 - Aerosols and propellants (sprays used in cosmetics, disinfectants and air fresheners)
 - Air pollution (chemicals and small particles in the air that can come from cars and trucks or factories)

Health Problems Caused by Environment – Full Question / Answers

- Based on what you know, how often are these **health problems in children caused by poisons or chemicals (toxins) in the environment?** By environment, we mean the air, water, food, and other things that are in the places where you and your family live, play, work, or go to school.
 - Breathing problems, like asthma (respiratory diseases)
 - Being born too early
 - Problems with brain, development, or learning (including autism and ADHD)
 - Skin problems (rashes)
 - Cancer (tumors or abnormal growths)
 - Poisonings
 - Problems with hormones, including diabetes (endocrine problems)
 - Problems with genes (genetic problems)
 - Nutrition problems (including being overweight or obese, underweight, vitamin deficiencies)

Motivation to Take Action – Full Question / Answers

- Which of the following things would you do to decrease the amount of toxins your family sees, or is exposed to? (Yes/No)
 - Buy special products labeled as organic or having safe levels of chemicals and pollutants
 - Spend more each week on groceries
 - Decrease the amount of fish your family eats to just once a week (some fish may have toxins)
 - Use cold water instead of hot water from the sink for cooking
 - Not leave the car running when it is parked
 - Use the car less
 - Put a carbon monoxide alarm in your house
 - Call the company that provides the water to your home to get a report about the results of tests they do to check how good the water is
 - Use a kit to test your home for lead, mold, or radioactive things (such as radon)
 - Wipe off toys, doorknobs, and other places in your home using things that kill germs like bacteria or viruses (disinfectant)