Using Developmental Science to Promote Child Health

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Today’s Talk

- Child health in social context
- Why a developmental perspective is important
- Childhood Obesity research and implications for intervention
- Child environmental health and community partnerships in Grand Rapids / Kent County
- Future Directions
Health and Well-Being of US Children

• 1 in 14 children/adolescents w/chronic health conditions

• 1 in 6 children/adolescents w/behavioral, mental health difficulties

• 1 in 3 children ages 5-19 overweight (2009-2010); 1 in 4 preschoolers

• Child health shapes adult health; prevention is essential

http://www.niddk.nih.gov/health-information/health-statistics/Pages/overweight-obesity-statistics.aspx
Early-Emerging Income Disparities in Obesity

- 40% of low-income children overweight by 3 years of age
  - Tracks strongly over time

- Chronic poverty: a ‘toxic stress’ pathway to obesity

- In Michigan:
  - over 1 in 5 children ages 0-17 live in poverty
  - almost 1 in 3 of children ages 0-5 eligible for food assistance

Kids Count Michigan 2014 data

How can a Developmental Perspective Inform Childhood Obesity Prevention?

- By determining how child health is influenced by social-environmental contexts of children and their parents.

- By guiding when, where, and how to intervene:
  - Early intervention -> later benefits

- By discovering new pathways to risk that can inform intervention.
Head Start and Childhood Obesity Study

- Whole-Child Approach:
  - Promotes parent involvement; provides nutritious meals & physical activity; builds social-emotional and school readiness skills

- Partnered with 13 Head Start agencies in Michigan to examine BMI over time (over 40,000 children ages 3-5 years)

- Compared 3 groups:
  - Head Start
  - UM Health System Medicaid
  - UM Health System not Medicaid

NICHD/NIDDK R21 DK095695
Results

Obese and Overweight children attending Head Start had healthier weight trajectories than children in other groups.

Child and Family Stress, Health And Development Lab

Identifying Pathways to Inform Early Childhood Intervention

“Toxic Stressors” Associated with Poverty:

- Child trauma
- Parent stress, trauma
- Low social support
- Chaotic home life
- Housing instability
- Limited resources
- Unhealthy food environment
- Unsafe neighborhoods
- Environmental exposures

BIOBEHAVIORAL STRESS

Biological Stress Disrupts Metabolism

Obesity

Stress Alters Behavior (sleep; stress-eating)


Eating Behavior: Early Risk Factor?

- Comfort foods are neurobiologically calming, and accessible to children
- Stress-eating -> weight gain in adults
- We find that...
  - Prior to age 3, eating behavior style is associated with higher weight
  - Early-life stress associates with “obesogenic” eating styles
  - Parents are asking for help to manage mealtime challenges, food demands
- Tailor intervention to children at risk?
Development Guides Obesity Prevention

Eat Healthy & Don’t Smoke
Breastfeed, Delay solid foods
Let Child Decide
Maturing Tastes, Help cook
Peers, Schools, Vending, Puberty
Exercise, Sleep & Eating Habits

- Prenatal
- Infant/Toddler
- Preschool
- School Age
- Adolescent
- Young Adult

- However, current approaches don’t work for everyone
- Individual factors (e.g., eating behavior) may increase risk
- Stress, poverty can interfere
Broader Environmental Context and Community Outreach

SCHOOL OF PUBLIC HEALTH
CHILDREN'S ENVIRONMENTAL HEALTH CENTER
UNIVERSITY OF MICHIGAN
UM-CEHC: Lifecourse Exposures and Diet
(K. Peterson, Director; A. Miller, Outreach)

Exposure to BPA, Phalates, Metals (prenatal, pubertal)

Biological Changes (studied in animals and humans)

How do exposures + diet shape growth, development over time?

Do prenatal, pubertal exposures + diet predict adult health?

Environmental Exposure

Biological Changes

Weight Status Maturation

Chronic Health Conditions

Infertility
Hypertension
Sleep Apnea
Type 2 Diabetes
Liver Disease
Heart Disease
Some Cancers
Osteoarthritis

NIH/EPA P20 ES018171/RD 834800, P30 ES017885; P01 ES02284401/RD 83543601, P30 DK089503
The Community Outreach and Translation Core (COTC) is an important part of the Children's Environmental Health Center (CEHC). Designed to offer input into the Center's activities and to benefit from cutting-edge research findings, the COTC provides the UM-CEHC a vehicle for sharing children's environmental health research to a range of audiences including parents, families, communities, public health professionals, and advocacy groups.

Outreach Initiatives

Links to Community Partners

Products
UM-CEHC-Grand Rapids Collaborative

“Healthy Environments, Healthy Children”

• Asthma Mapping Project
• Geography of child asthma in GR / Kent Co.
• Head Start children
MAP DATA FINDINGS:
Regardless of race/ethnicity, asthma cases are concentrated around housing complexes.
Future Directions and Implications

• New Approaches to Obesity Prevention, Child Health Promotion
  • What drives different children to eat differently?
  • How can diet reduce effects of environmental exposures?
  • Intervene w/ parents to reduce their own stress, establish routines?
  • Future GR / Head Start collaborations?

• Early exposure to high-stress environments can increase child health risks, challenge parents, and promote health disparities
  • Research can help us identify where to focus limited intervention dollars
  • Community partnerships can help us implement cross-sector solutions
Thank You!

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