

School-based BMI Screening:

A Foot in the Door to Preventing Childhood Obesity?



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Community Advisory Board



- **Role:** advise on contextual issues, recruitment strategies, data collection tools and methods; provide feedback on interpretation of findings; and plan for dissemination of results and future studies

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Learning Objectives



- Understand emergence of school-based BMI screening as a prevention strategy and concerns
- Examine variables analyzed with longitudinal trends of elementary students' BMI
- Discuss feasibility of motivating parents to prevent childhood obesity through BMI report, parent screening of family practices, and self-directed online education

Childhood Obesity: Complex Etiology

• Six-Cs Model

- **Cell**-obesity predisposing genes
- **Child**- behaviors, **BMI**, body image, race/ethnicity, gender
- **Clan**- *parent practices, home environment*, siblings, SES
- **Community**-medical attention, *school environment*, built environment, community SES
- **Country**- health care system, media, transportation infrastructure, national economy
- **Culture**-gender role expectations, weight bias, leisure norms

• How is model different from other ecological perspectives?

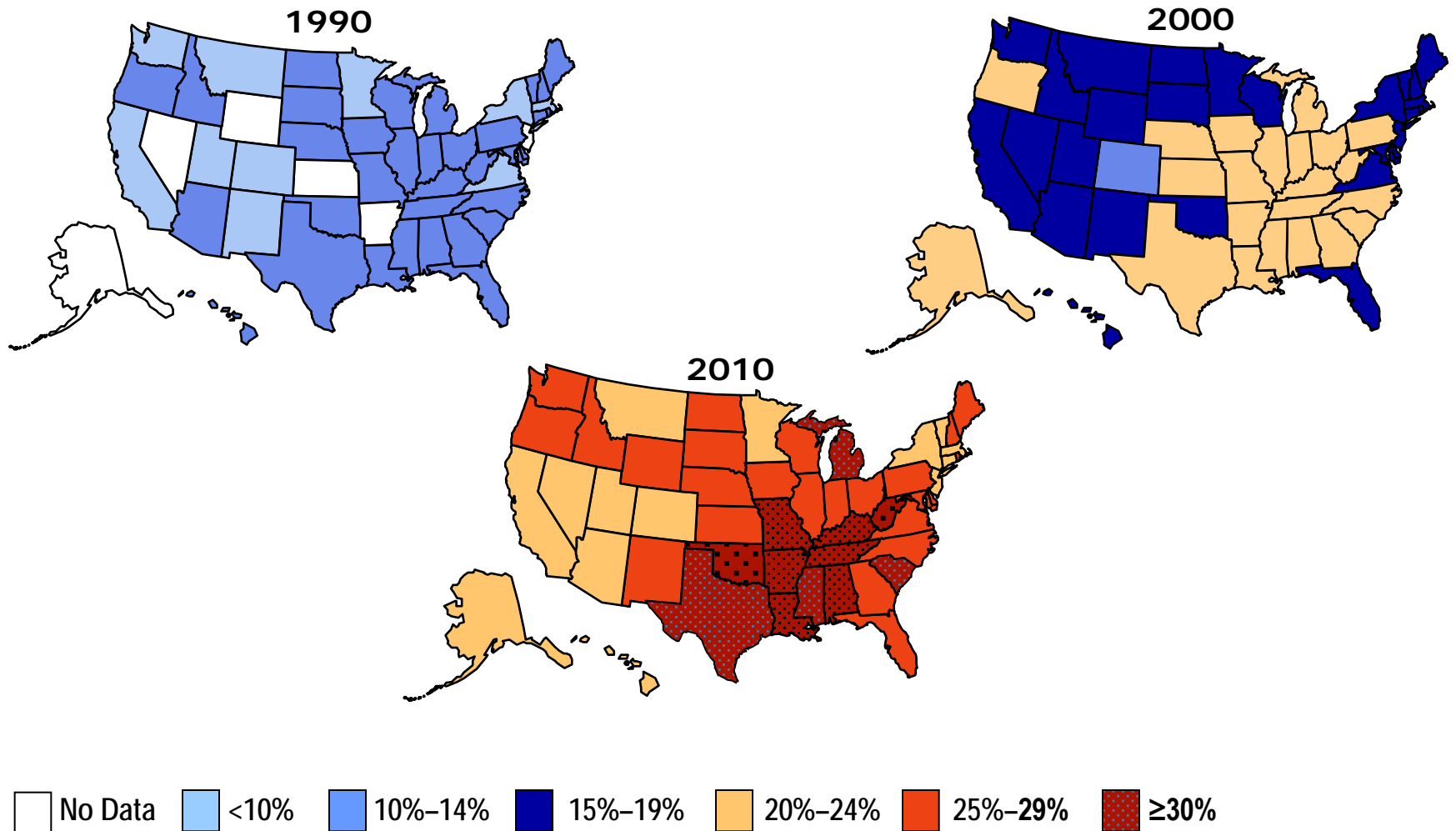
- Constitutional and relational factors recognized
- **Attitudes, knowledge**, behavior recognized
- Contextual influences such as social, physical, economic and **political** recognized
- Suggests developmental differences

Harrison K et al. (2011). Toward a developmental conceptualization of contributors to overweight and obesity in childhood: The Six-Cs Model. *Child Development Perspectives*, 5 (1): 50-8.

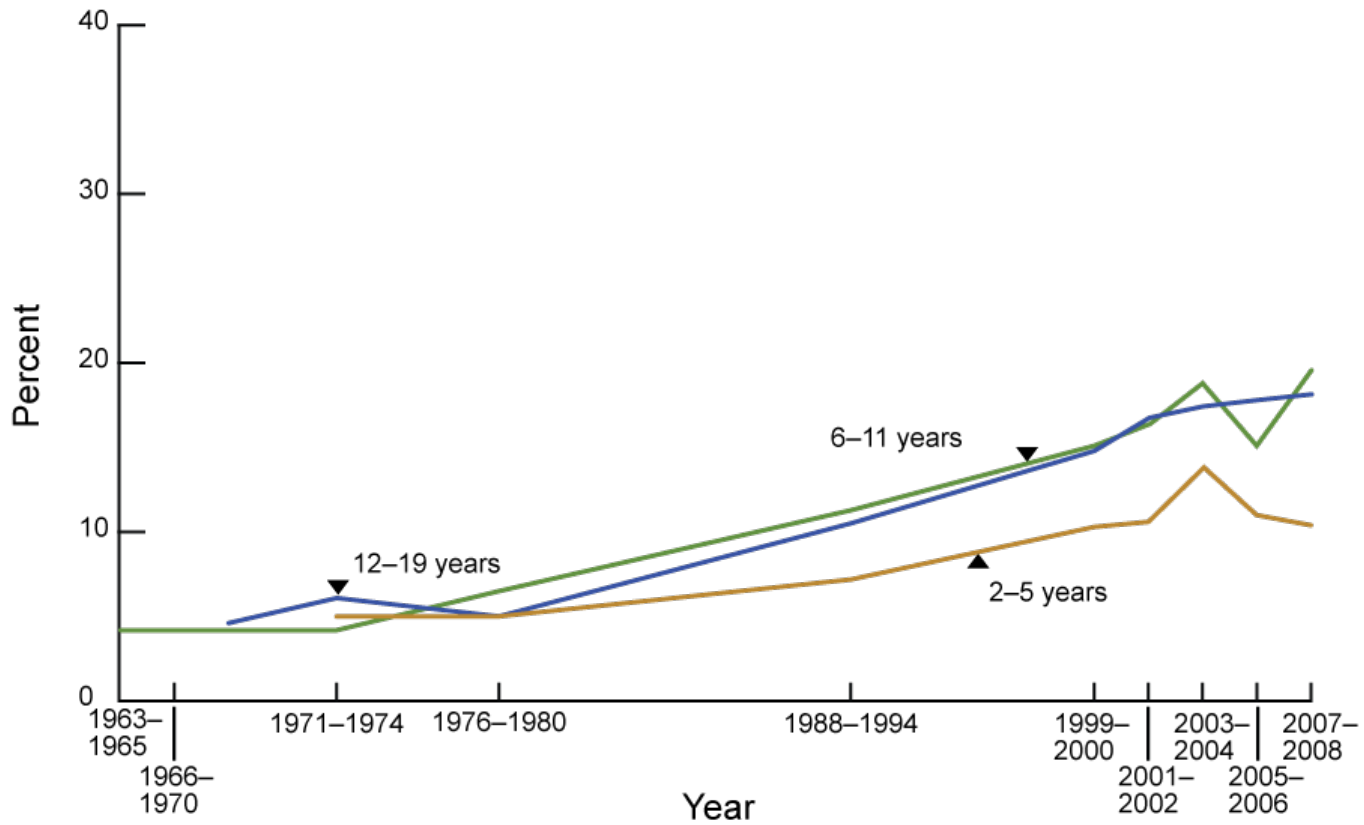
Obesity Trends* Among U.S. Adults

BRFSS, 1990, 2000, 2010

(*BMI ≥ 30 , or about 30 lbs. overweight for 5'4" person)

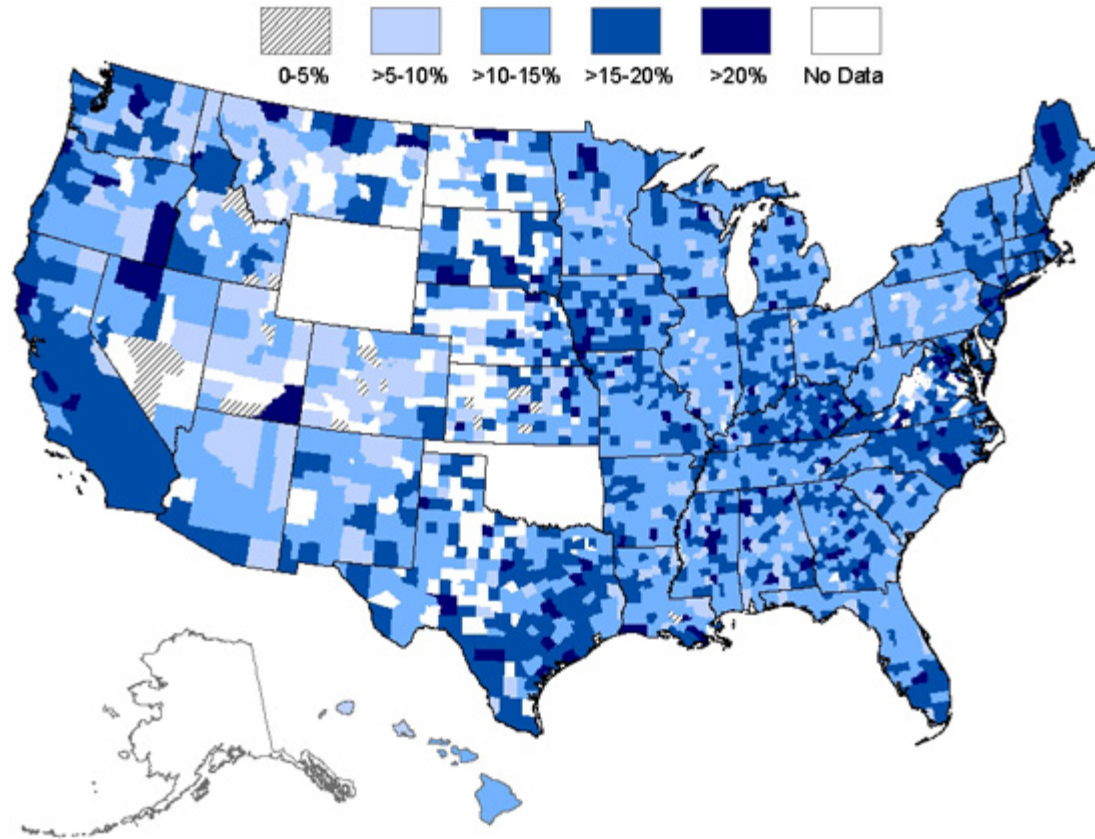



**Figure 1. Trends in obesity among children and adolescents:
United States, 1963–2008**



NOTE: Obesity is defined as body mass index (BMI) greater than or equal to sex- and age-specific 95th percentile from the 2000 CDC Growth Charts.
 SOURCES: CDC/NCHS, National Health Examination Surveys II (ages 6–11), III (ages 12–17), and National Health and Nutrition Examination Surveys (NHANES) I–III, and NHANES 1999–2000, 2001–2002, 2003–2004, 2005–2006, and 2007–2008.

2007-2009 County Obesity Prevalence Among Low-Income Children Aged 2-4 Years





“As in any epidemic, the strategies and tools used to combat the imminent threat are frequently based on scientific rationale and experience but applied in areas in which we lack complete understanding. The urgent need for information requires execution of decisions that are not risk-free—such as in the case of BMI screening obesity.”

Joseph W. Thompson, MD, MPH and

Paula Card-Higginson,

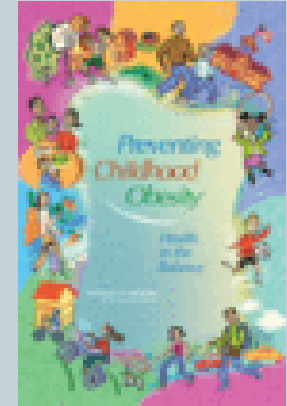
Pediatrics, 2009



Prevention: School-based BMI Screening



- **Institute of Medicine (1)**
 - Annual height, weight, BMI percentiles
 - Make information available to parents
- **Rationale**
 - Not routinely assessed in clinical settings (2,3)
 - Positive history of school screenings for other health concerns
 - Large population reach
 - Parents lack awareness child weight & health risk (4, 5)
 - **Motivate parents to seek medical care & make healthy lifestyle changes**



Increasingly Practiced

State legislatures act (6,7)

- Eight states require screening and surveillance
 - Arkansas, Delaware, Illinois, Massachusetts, New York, Ohio, **Pennsylvania**, Tennessee
- South Carolina- screening only
- Six additional states conduct surveillance only
 - California, Florida, Louisiana, Texas, Vermont, West Virginia

6- Linchey & Madsen (2011). *Prev Chron Dis*, 8 (5): A101

7- Nihiser et al. (2009). *Pediatrics*, 124: 89-97

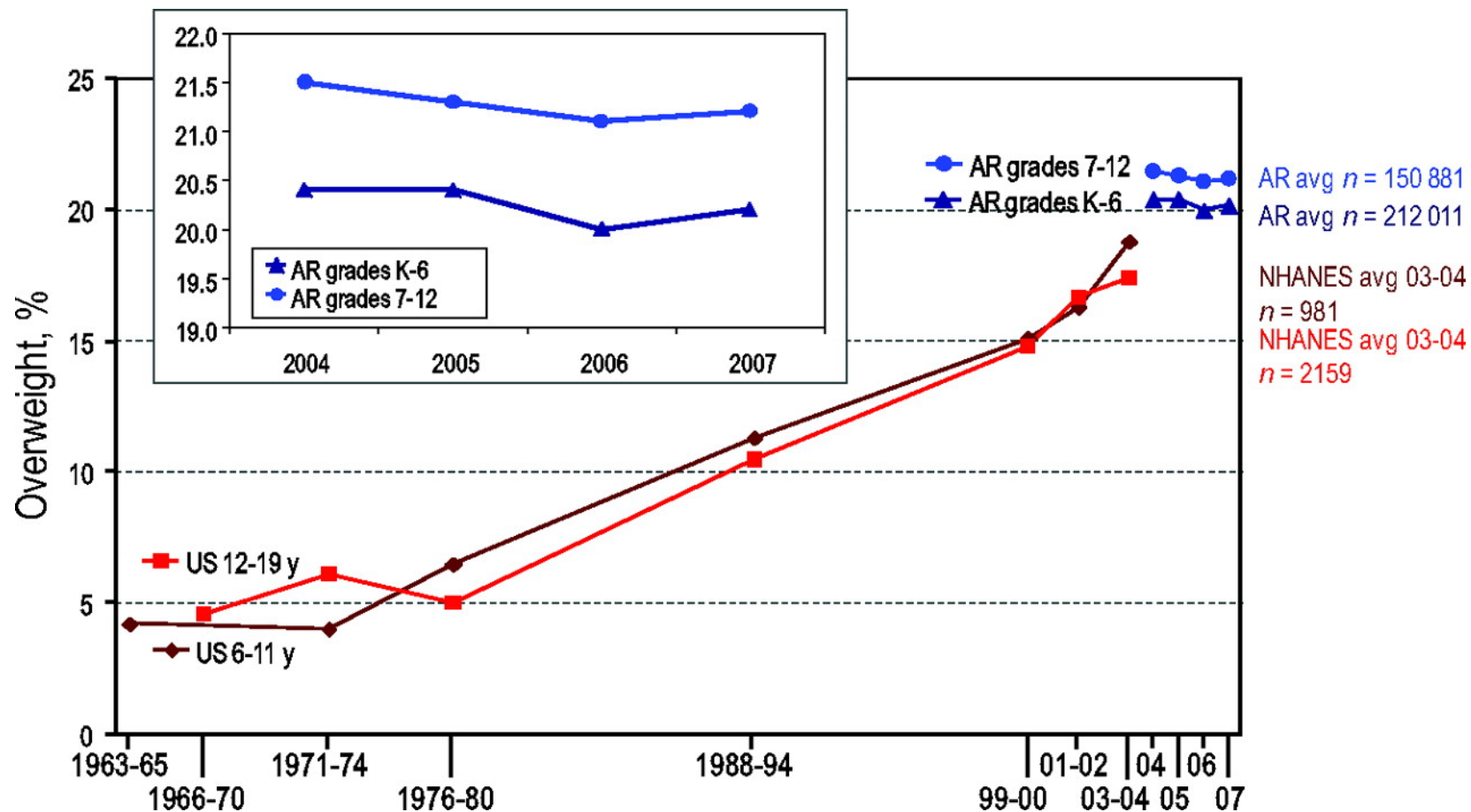


Many Unanswered Questions



- **Physical, social, and psychological effects unknown**
 - BMI reports could increase risk of unhealthy eating behaviors if child perceives BMI is high ⁽⁸⁾
- **Impact of screening on preventing obesity is inconclusive**
 - California- parent notification had no impact on middle school students' BMI ⁽⁹⁾
 - ✦ **HEALTHY- 42 middle school RCT- no difference between groups in reductions of percentage of children with BMI $\geq 85^{\text{th}}$ percentile; potential effect of growth screening? ^(10, 11)**
 - Arkansas- attributed halted progression of obesity to screening, surveillance, and program interventions ⁽¹²⁾

National and Arkansas childhood obesity trends



Thompson J W , Card-Higginson P Pediatrics
2009;124:S73-S82

More questions than answers



- **Parent level**

- **Effect on parent awareness of actual child weight, overcome misperceptions?**
- **Effect of communications on motivating or subsequent parent action**
- **Effect on parent behaviors, do parents become restrictive?**
- **Effect on family practices and home environment**

- **School level**

- **Cost-benefit unknown**
- **Variability of measurement and communication practices**
- **Integration with healthy eating and physical activity policies, practices, and programs**

- **Community level**

- **Continuity with medical providers**
- **Integration with other community resources such as Extension programs**



A Starting Point

Evaluating the Impact of Statewide BMI Screening Initiative in Elementary Schools

R21 NICHD

- **Aim 1**
 - Evaluate the impact of different school practices and policies on school-level BMI outcomes overtime
- **Aim 2**
 - Test feasibility of adding a parent screening tool and education with standard BMI reports on parent motivation, perceptions of BMI, and actions
- **Aim 3**
 - Evaluate effectiveness of adding family-based education program as extension of standard BMI reports

Correlations with School-level Factors



- **School Nurse Practices**
 - Surveyed in 2007 and 2010
 - Practices and environments for assessing students
 - Parent communication

- **Nutrition, Physical Activity School Policies**
 - WellSAT
 - ✦ School Wellness Policy Quality Measure
 - ✦ *May* include implementation measures

Feasibility Study: Parent Motivation

Intervention

(n=15 elem schools)

- Standard BMI report plus
- Family Nutrition and Physical Activity Screening Tool
- Kids Eat Right Educational Materials
- Parent survey

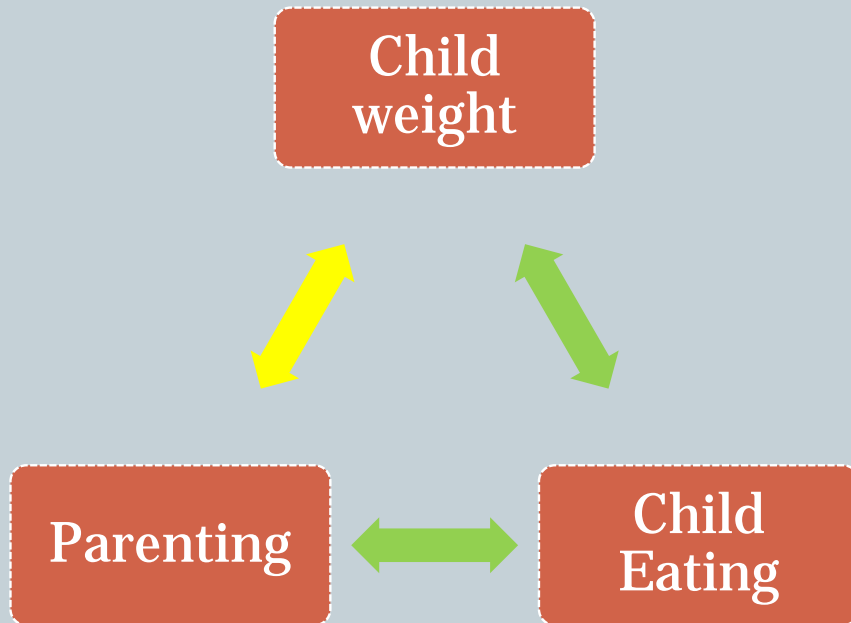
Control

(n=16 elem schools)

- Standard BMI report
 - PA Department of Health Template or a local variation
- Parent survey

Moving the Needle for Obesity Prevention

Conceptual Mediation Model



Ventura AK & Birch LL (2008). Does parenting affect children's eating and weight status? *Int J Beh Nutr Phys Act*, 5: 15.

Family Nutrition and Physical Activity Tool

- Family practices and environments predicts child weight status
 - Child baseline BMI, parent BMI and other demographic variables controlled (p=0.049)

Ihmels MA, Welk GJ, Eisenmann JC, Nusser SM, & Meyers EF (2009). Prediction of BMI change in young children with the Family Nutrition and Physical Activity Screening Tool. *Ann Behav Med*, 38: 60-8.

Theoretical Basis for Intervention



- **Health Belief Model**
 - BMI report influences individual perceptions of susceptibility and seriousness of health risk related to child's weight
 - FNPA provides a cue to action greater than BMI report alone
 - Taken together, these influence perceived threat related to child's weight and likelihood of parent taking action
- **Transtheoretical Model**
 - Stages of Change
 - Adding FNPA to BMI report will positively influence parent readiness to change
- **Self-Directed Learning** ⁽¹³⁾
 - Motivated parents will initiate, self-manage, and monitor learning
 - Adding FNPA enhances self-management of home practices and environment
 - Kids Eat Right places responsibility for learning with parents

Intervention

Family Nutrition & Physical Activity Screening Tool

Kids Eat Right Initiative

Family Nutrition and Physical Activity Screening Tool



[About](#)
[Contact Us](#)
[Home](#)



[About FNPA](#)
[CCPH](#)
[Research](#)

Family Nutrition and Physical Activity Screening Tool.

This short and easy to complete assessment will allow you to evaluate your family's home environment with regard to nutrition and physical activity. The survey only takes about 5 minutes to fill out and will provide you and your family with valuable information and tips about promoting healthy lifestyles in your family.

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For Information Contact: Department of Kinesiology, 235 Forker Building, Ames, Iowa 50011, Phone:515-294-8009

- Academy of Nutrition and Dietetics and AND Foundation
 - 71,000 members (RD)
 - Support a **quality nutrition** approach in schools, communities, with **parents**, media and policymakers

Construct Validity



- Factor analyses revealed that the items loaded on a single factor (alpha reliability = 0.70)
- Logistic regression revealed that children with a **total score in the lowest tertile (high risk family environment) had a greater likelihood of being overweight (odds ratio = 1.7).**

Welcome to KidsEatRight.org

your source for scientifically-based health and nutrition information you can trust to help your child grow healthy. As a parent or caretaker you need reliable resources and you can find them here, backed by the expertise of nutrition professionals.



shop smart

To encourage a healthy lifestyle, get your children involved in selecting the food that will appear at the breakfast, lunch or dinner table.



cook healthy

Involve your child in the cutting, mixing and preparation of all meals. Even a snack can be healthy.



eat right

Sit down together as a family to enjoy a wonderful meal and the opportunity to share the day's experiences with one another.

Join our online communities



article of the week

Healthy Children are a Family Affair

Parents are children's biggest influences when it comes to healthy behaviors, so provide your kids with opportunities for family fun. You can help your children learn to make healthier food... [more »](#)

[more articles](#)



hot tip

Sneak 'Em In

Have a challenge getting your family to eat vegetables? Then maybe you need to get sneaky so they can reap the benefits. [more »](#)

★★★★★
reviews (1)

[more tips](#)



recipe of the week

Spinach and Artichoke Dip

This tastes amazing plus it's loaded with protein and calcium. Dip away with pita chips or a colorful assortment of crunchy veggies. [more »](#)

[more recipes](#)

featured video



Family Food Rules

It's important to have food rules. For example, Mom is the Executive Chef and not the short-order cook. [more »](#)

★★★★★
reviews (8)

[more videos](#)

Outcome Measures



- **Main effect:** Parent readiness to change family practices and home environment
- **Other measures**
 - Parent awareness of child weight
 - Parent concern for child weight
 - Parent perceptions of screening report quality
 - Child factors
 - Parent factors

Next Steps



R01- Family Interventions

- Does parent motivation lead to changes in practices and home environments?
 - Under what conditions is this most effective?
 - How does the messenger (e.g., school, MD) influence motivation?
 - How are new practices maintained overtime?
- What is the effect of changing family practices on child eating, physical activity, sleep, and sedentary activity?
- What is the effect of changing family practices and home environment on child weight?

Discussion Questions



- What is the potential and promise of motivating parents to prevent childhood obesity in elementary school?
- How can BMI screening policy be defended in the absence of effects on parent readiness to change?
- How can lessons from other prevention efforts inform childhood obesity prevention?