The Society for Clinical Child and Adolescent Psychology (SCCAP): Initiative for Dissemination of Evidence-based Treatments for Childhood and Adolescent Mental Health Problems

With additional support from Florida International University and The Children’s Trust.
Keynote Overview
Evidence-Based Psychosocial Interventions for Pediatric Obesity

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Outline

- Review background information on pediatric obesity
- Describe lifestyle and behavioral interventions for pediatric obesity
- Review the evidence base for these interventions
- Future directions for intervention research

Conflict of interests: None
The Plumpening (Figure 1)

Since the early 1960s, the percentage of overweight children ages 6 to 11 has almost quadrupled.

Note: According to the Centers for Disease Control (CDC), an “overweight” individual has a body mass index (BMI) at or above the 95th percentile of the CDC’s sex-specific BMI growth chart. The point estimates on the graph are the result of surveys administered in five time periods: 1963-65, 1971-74, 1976-80, 1988-94, and 1999-2000.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, “Health, United States, 2003”
Shifting Weight | Obesity rates among children age 10-17, in 2007

- Proportion of obese children increased since 2003
- Decreased since 2003

Note: Obesity classification is based on children’s body mass index for their age. Children in the top 5% on growth charts were considered obese. Source: National Opinion Research Center
Prevalence

- 2009-2010 data (Ogden et al., 2012)
  - 16.7% are obese
  - 31.8% are overweight or obese

- No upward trend from 2000-2010
  - Slight increase for males (18.6%), but not females (15.0%)

- Higher rates for African American & Hispanic Youth
  - 14.0% of Caucasian youth
  - 21.2% of Hispanic youth
  - 24.3% of African American youth

Definition

- **BMI** = body mass index = kg / meters$^2$
  - It is an estimate of body fat/adiposity

- Adults use strict BMI cutoffs
  - Obese = BMI 30+
  - Overweight = BMI 25 to 30

- Child categories based on BMI for age and gender
  - Obese = 95$^{th}$ percentile and above
  - Overweight = 85$^{th}$ to 95$^{th}$ percentile
Health Impacts

- Tracks into adulthood
- During childhood & adolescents at greater risk for:
  - Type 2 diabetes
  - Sleep apnea
  - Non-fatty liver disease
  - Orthopedic problems (i.e., Blounts disease)
  - Hypertension, dyslipidemia & abnormalities in coronary arteries

Psychosocial Impacts

- Are at increased risk for psychosocial problems
  - Lower body image & self-esteem
  - Peer victimization
  - Depressive symptoms

- Important factor is stigmatization

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1 Institute of Medicine (2005). Preventing Childhood Obesity: Health in the Balance
Why the Dramatic Increase?
Dietary Intake

- ↑ consumption of, and greater access to, pre-packaged, calorie dense foods anytime, anywhere
- ↑ meals consumed away from home
- ↑ portion size
- ↑ sweetened beverage intake

Toxic Environment

- Family environments, marketing and public policies that encourage overeating and inactivity
  - Proliferation of opportunities for sedentary activity
  - Built environment
  - Less time for PA in schools
  - Marketing targeting kids
  - Changes in family lifestyle
Even When We Try............

Childhood obesity. Don't take it lightly.

Food Stamps can help. Call 1-888-328-3483 to see if you qualify.

McDonald's

my kinda shoppin' spree

Dollar Menu

M's Kitchen

Calories & Chinese

Take Out or Deli

Tel. (310) 594-1111
Good News

FEED YOUR CHILDREN WELL
MY FIGHT AGAINST CHILDHOOD OBESITY
BY MICHELLE OBAMA
Good News

➢ Improvements in diet and exercise can be effective in reversing some of these problems

➢ Reductions in weight status => improvements in insulin, fasting glucose, lipid levels, triglycerides, and blood pressure

• BMIz ↓ of ≥ .15 lead to improvements in *one component* of MS \(^1\)
• BMIz ↓ of ≥ .50 lead to improvements in *all components* of MS \(^2\)


Ecological Model

Taken from http://www.balancedweightmanagement.com/TheSocio-EcologicalModel.htm
Comprehensive Behavioral Family Lifestyle Interventions

- Multi-component programs
  - Education & counseling
    - Nutrition
    - Physical activity
    - Behavioral strategies

- Group or individual format

- Usually include child and parent in treatment

- In-session physical activity component

- Vary in duration and intensity
Dietary Change

- **Education on well-balance diet & food preparation**
  - USDA’s MyPlate guidelines\(^1\), portion sizes, nutrition labels, eating breakfast, encouraging family meals, limiting meals away from home\(^2\)

- **Stoplight or Traffic Light system\(^3\)**
  - Categorize as Green, Yellow, and Red based on nutrient content

- **Reduce caloric intake**
  - Balanced deficit diet (for example caloric intake of 1200-1500)
  - Substitute Green & Yellow foods for Red foods

- **More streamlined dietary targets**
  - Increase fruits, vegetables, or fiber
  - Decrease intake of sweetened beverages

\(^1\)http://www.choosemyplate.gov


Children should get 60 minutes per day of moderate PA

Target increase physical activity through lifestyle and play
- Set objective goals
- Increase opportunities for high value new activities
  - Structured aerobic activities, organized sports
  - Dance, interactive movement-based video games
  - Family activities, lifestyle activities

Target decrease in screen time

Behavior Change Strategies

- Self-monitoring
- Define target behaviors
- Goal setting
- Positive parenting
- Stimulus control
- Modeling
Other Critical Features

- Assessing goal achievement and barriers to change; revising plans as necessary
- Integrate various behavioral components as necessary throughout the program
- Support from interventionists and other participants
- Address emotional and social issues
- Making it positive and fun!!
Commonly Used Methods for Reporting Weight Status

- Weight
- BMI
- BMI $z$
- Percentage Overweight
Weight Maintenance vs. Weight Loss

- As children grow, maintenance of weight while growth in height will lead to a decrease in BMI.

- Weight maintenance often is the initial goal.
  - If lack of treatment success, weight loss may be recommended.

- When weight loss is encouraged, should not exceed:
  - 1 lb/month for children 2 to 5 yrs
  - 2 lbs/week for obese older children and adolescents.

Individual Studies
Epstein’s Series of Studies

- Six month comprehensive behavioral program
- Children & parents attend simultaneous but separate groups
- Stoplight diet
  - Self-monitoring, goal setting, & other behavioral strategies
  - Targeted calorie intake of 1200-1500 calories/day
  - Green foods > 40/wk; Red foods < 15 wk
- Physical activity & sedentary activity change
- Targeted parents for change

1Epstein et al (2007). Family-based obesity treatment, then and now: Twenty-five year of pediatric obesity treatment. *Health Psychology, 26*, 381-391
Epstein’s Series of Studies

➢ General effect sizes:

  6 months = -1.20
  12 months = -1.02
  24 months = -0.82
  60 months = -0.55
  120 months = -0.67

➢ At 10 year follow-ups:

  • 34% of participants decreased percentage overweight by 20%
  • Roughly 30% were no longer obese

➢ Younger children showed larger change up to 24 months

➢ Girls benefited more than boys over long-term


- **Bright Bodies Program** (Yale Pediatric Obesity Clinic)
- 174 children 8 -16 yrs (above 95th %) – Diverse sample
- BB group treatment included 98 hours of contact
  - Educational meetings (wkly for first 6 mos; bi-wkly for next 6 mos)
  - 50 minute exercise sessions 2x/week for first 6 mos; 2x/month for last 6 mos
  - Facilitated by dietician or social worker, and an exercise physiologist
- Control kids seen in clinic 1x every 6 months for dietary counseling


➤ Results at 12 months
  • 71.4% in BB vs 63.8% in controls completed assessment
  • BMI: -1.7 for BB vs +1.6 increase for controls (p < .001)
  • Significant improvements in body fat, cholesterol & insulin for BB youth
  • No differences in blood pressure, glucose, and HDL or LDL cholesterol

➤ Results at 24 months
  • 42.9% in BB vs 44.9% in controls completed assessment
  • BMI: -0.9 for BB vs +1.9 increase for controls (p < .001)
  • Also improvements in Total & LDL cholesterol, & insulin resistance for youth in BB

Wilfley et al (2007)

- 148 children (ages 7 -12 yrs), 20% to 100% overweight
- All received a 5 month behavioral family intervention
  - Exhibited mean change in BMIz = - 0.22
- Randomized to 1 of 3 maintenance treatments (4 months) (n = 148)
  - Behavior Skills (BSM) - specific weight maintenance skills
  - Social Facilitation (SFM) - social skills and support
  - Control
- Results at 24 months (used intent-to-treat analysis)
  - BSM & SFM not differ at any time point
  - Pooled BSM/SFM lead to greater decrease in wt outcomes at 9 mos vs controls
  - No significant differences at 1-Yr and 2-Yr follow-ups
  - Baseline social skills moderated 2-yr outcomes


- 118 overweight adolescents (ages 13 – 16 yrs) and parent(s)

- Randomized to **CBT + Aerobic Ex** OR **CBT + Adventure Therapy**
  - Sixteen 1-hour wkly education sessions + 4 bi-wkly maintenances sessions
    - Balanced deficit diet (1400-1600 calories) and gradual increase in PA to 60 minutes/day
    - Behavioral topics (self-monitoring, motivation for weight loss, goal setting, stimulus control)
  - Weekly 60-minute activity sessions (Aerobic EX or ADV-Therapy)
    - **Adv Therapy**: Outward Bound activities consisting of physical & mental challenges to develop social skills, problem-solving abilities, & self-confidence
    - **Aerobic Exer**: Use of treadmills, stationary bicycles, dance videos, brisk walking and other aerobic activities within the clinic setting.

- Results
  - Significant decrease of roughly 1 BMI unit for both groups at month 12

Meta-Analysis and Systematic Reviews
Reviews, Meta-Analysis & Position Papers

- Jelalian & Saelens (1999) – SR
- Summerbell et al (2003) – Cochrane Database
- Seo et al (2010) - MA
- Faith et al (2012) - PP

MA = Meta-Analysis; SR = Systematic Review; PP = Position Paper/Statement
Wilfley et al (2007)

- Meta-analysis of 14 RCTs from 1976 to 2004

- Inclusion criteria
  - RCT of lifestyle interventions; duration ≥ 4 weeks
  - Treatment of overweight/obese youth; age ≤ 18 years

- Results
  - Treatment duration ranged from 9 wks to 77 wks
  - Timing of follow-up (1 month to 5 years); attrition (5% to 46%)
  - ES ranged from .48 -.75 at post-tx and .60 -.91 at follow-up

- Conclusions
  - No moderator effects (age, gender)
  - Trend for more powerful effects with longer treatment
  - Decrease in ES as follow-up was further removed from baseline

Meta-analysis of 66 lifestyle intervention studies: 1965 to 2004

Inclusion criteria
- RCTs examining treatment of overweight/obesity in youth ≤ 18 yrs
- No requirement for length of treatment
- No indication of requirement for intent-to-treat analysis

Results
- Overall ES at post-treatment (ES = 0.41)
- At follow-up (n = 11), small ES = 0.22
- Parent involvement associated with greater effect sizes
  - Larger ES when parents educated about nutrition and food preparation
  - ES 3x larger when parent training in behavior management
  - No difference based on if parents were targeted for weight loss

Cochrane Review (2010)

- Included 54 studies on lifestyle interventions (1985-2008)

  - General impressions
    - Many studies showed positive effects on adiposity
    - Parent involvement very beneficial, especially with younger children
    - No evidence of adverse effects

  - Treatment duration ≥ 6 months; intent-to-treat analysis

  - Results of meta-analysis on multi-component behavioral interventions:
    - Age < 12 yrs: 4 studies of behavioral interventions.
      ES = -0.06 at 6 months. Not maintained at 12 or 24 mos.
    - Age > 12 yrs: 3 studies of behavioral interventions.
      ES = -0.14 at 6 months; Maintained at 12 months

  - Insufficient dietary & PA treatment studies to conduct meta-analysis

Systematic review of behavioral weight management interventions

11 high quality studies (4-18 yrs of age) (most published since 2005)

- At 6-12 months change in weight status was modest with differences between BI & control youth ranging from 0.3 to 3.3 BMI units.
  - Three comprehensive programs of mod/high intensity resulted in BMI differences of 1.9 to 3.3 between groups
  - For 8 yr old boy/girl => 13 lb difference
  - 12 yr old boy/girl => 17-18 lb difference

- Evidence of ↑ insulin resistance in med/high-intensity comprehensive tx

- No evidence of adverse effects (i.e., slowed growth, eating disorders)


- Assigned evidence category of “Grade B”

“.....Adequate evidence that multi-component, moderate-to high-intensity behavioral interventions (> 25 hours in 6 months) for obese children and adolescents aged 6 years and older can effectively yield short-term (up to 12 months) improvements in weight status.”

Conclusions

- Data supports short-term efficacy of lifestyle interventions in ages 6+ yrs
- Best improvements in comprehensive, high-intensity, behavioral programs
- Longer treatments associated with greater improvements
- Parent involvement is beneficial, most notably in younger children
Conclusions

- Some evidence of clinically significant improvements
- Little, if any, evidence of adverse effects
- Less than optimal generalizability
  - Many studies in specialty obesity clinics, with moderate-to-high intensity treatment
  - Highly trained interventionists
  - Mostly Caucasian participants
  - Degree of obesity
Translation and Dissemination to Real World Settings

- “One of the greatest challenges facing health promotion and disease prevention is translating research findings into evidence-based public health and clinical practices.”

- “RCTs in real world settings are extremely valuable but much too rare………. now is the time for more solution-oriented intervention studies in real-world community settings.”

1 Kerner et al (2005). Introduction to the special section on dissemination: Dissemination research and research dissemination: How can we close the gap? Health Psychology, 24, 443-446.

2 Robinson et al. (1999). Reducing children's television viewing to prevent obesity: a randomized controlled trial. JAMA, 297, 2697-2704.
Translation and Dissemination to Real World Settings

- Balance the needed intensity and duration of treatment contacts with what providers and participants can do in real world settings
- Need RCTs in delivery settings and/or using modes of patient contact that are accessible and sustainable
- Interventionists with diverse skills set and how to best train them
- More RCTs with economically and racially diverse participants
- Can effectiveness be maintained with larger trials
Funded by NIDDK Planning Grant for Translational Research

Intervention delivered to overweight/obese youth in rural settings at Cooperative Extension Service offices
  • Ages 8 to 14 who were overweight or obese

Randomized to 1 of 3 conditions:
  • Behavior Family, Behavior Parent-Only, and waitlist control

Treatment included 12 sessions over 16 weeks
Primary Care-Based Interventions
(Saelens et al, 2002)

- 44 adolescents (20% to 100% overweight)
- Healthy Habits treatment (HH)
  - Computerized assessment of lifestyle behaviors that generated action plan
  - One physician counseling session to review and finalize action plan
  - One meeting with PI to introduce self-monitoring
  - Weekly phone counseling for 4 months to facilitate behavior change
    - Modified stop light system to set goal of 1200 to 1500 calories/wk
    - 60 minutes of moderate PA 5 of 7 days/week

- Results
  - HH youth exhibited BMIz Δ of -0.05 vs +0.06 for control at post-tx (p<.02)
  - Similar, but non-significant differences at 3 month follow-up

Targeting Preschool-Aged Youth

- LAUNCH Project (Stark et al., 2011)
- 18 children (2-5 yrs), above 95th percentile of BMI
- Treatment
  - 12 weekly core intervention visits
    - Alternate between group meetings and individual home visits
    - Addressing dietary intake, screen time, physical activity & behavior strategies
    - Focuses first on breakfast, then lunch, dinner, & snack.
    - Given 14 day supply of vegetables at each group session; food exposures
- Results
  - Significant differences in BMI-z:
    - 6 months tx = −0.49 (0.36) vs control = +0.10 (0.32)
- Follow-up R01 is on-going

School-Based Interventions

➢ Planet Health (Gortmaker et al., 1999)
  • 2-yr program integrated into school curricula for 6th & 7th graders
  • Goals to decrease TV time & intake of high-fat foods; increase FV and PA
  • Prevalence of obesity in girls decreased from 23.6% to 20.3 in Tx schools

➢ Robinson et al (1999) - Intervention to reduce TV time in 3rd & 4th graders
  • 8 lessons incorporated into the standard curriculum + parent newsletter
  • Tx condition had ↓ BMI, waist circumference, TV and video games

➢ Lytle (2009)
  • Current state of the science is to assess a battery of measures related to weight or body composition……..and to report any change in any measure as evidence that the intervention was successful”

Robinson et al. (1999). Reducing children’s television viewing to prevent obesity: a randomized controlled trial. JAMA, 297, 2697-2704.
Additional Future Directions

- Develop and evaluate interventions that are culturally and linguistically appropriate for children and families from racially and ethnically diverse backgrounds

- Examine mediators and moderators of change

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Integrated Multi-Level Interventions

“Halting this epidemic may ultimately be determined by the quality and coordination of a range of obesity treatment initiatives, alongside an effective obesity prevention strategy.”

For more information, please go to the main website and browse for more videos on this topic or check out our additional resources.

**Additional Resources**

**Online resources:**
2. United States Department of Agriculture website: http://www.choosemyplate.gov

**Selected Peer-reviewed Journal Articles:**
Keynote: Evidence-Based Psychosocial Interventions for Pediatric Obesity by David Janicke, Ph.D.

Websites:
2. USDA MyPlate Guidelines: http://www.choosemyplate.gov

Books:


Peer Reviewed Journal Articles:


Full Reference List


