Health Fundango Program

Obesity in Children and Adolescents with Disabilities
Grant funding from NACCHO 2012

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The Parable of a River
Core Functions of Public Health and Essential Services

Assessment of the community’s health

Assurance that in the community, “the healthy choice the easy choice.”

Policy development
Public health aims to promote the well-being, prevent secondary conditions and eliminate disparities between people with and without disabilities in the U.S. population. Focus on obesity prevention for people with I/DD is essential.

**Assessment:** How do rates of overweight and obesity for people with I/DD compare with the general population?

**Assurance:** How can environments where people with I/DD live, learn, work and play, become less obesiogenic?

- Support healthy food and beverage choices
- Provide opportunities for regular physical activity

**Policy development:** How can laws, local ordinances and institutional policies support healthy lifestyles for people with I/DD?
Obesity Trends* Among U.S. Adults
BRFSS, 1985

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity in the U.S., 2011, by state
Over the past 30 years, the prevalence of obesity has quadrupled for children 6 to 11.

Source: Centers for Disease Control & Prevention
Average Daily Per Capita Calories Consumed
US food availability, adjusted for spoilage and other waste 1970-2010

Average Daily Per Capita Calories Consumed
US food availability, adjusted for spoilage and other waste 1970-2010

500 extra calories per day from added fat, sugar and larger portion sizes

Additional exercise required when calories exceed need
Health Fundango Program

Obesity in Children and Adolescents with Disabilities
Health Fundango Program

Why measure BMI of children enrolled in Special Education?

How many children in Missoula are in Special Education?

Do BMI rates change from kindergarten through 12th grade?
Implementing Health Fundango

Plan program and secure funding
Develop partnerships and agreement to clarify roles
Obtain equipment, materials, supplies
Develop promotion, educational and administrative materials
Recruit and train staff and students
Perform measurements as scheduled
Fulfill intervention requests
Create and disseminate reports
Present findings and implications to stakeholders
Quality Equipment and Educational Materials

- Tanita BWB 800S
- Educational Models

Rebecca Morley is the Eat Smart Coordinator for the Missoula City-County Health Department and chairs the Eat Smart Missoula Coalition. She is a key figure in promoting healthy eating and breastfeeding advocacy. Morley is a well-recognized figure for her efforts to encourage community support of breastfeeding and is a presence at many community health fairs, forums, and health promotion events.
Health Fundango in the Schools
Normal Bell Curve for BMI

- Definitely more than others
- Probably more than others
- Same as others
- Probably less than others
- Definitely less than others

SD = Standard Deviation
Among children of the same age and sex, overweight is defined on CDC growth charts as a BMI at or above the 85th percentile and lower than the 95th percentile. Obesity is defined as having a BMI at or above the 95th percentile.

Children With and Without Disabilities Obesity Rates

Among children of the same age and sex, overweight is defined on CDC growth charts as a BMI at or above the 85th percentile and lower than the 95th percentile. Obesity is defined as having a BMI at or above the 95th percentile.

Percentage of Obesity Among Children Ages 2-17, by Disability Status

- Obesity rates for children with disabilities are 38% higher than for children without disabilities.
- Children with Disabilities: 22%
- Children without Disabilities: 16%

From the 2008 Behavioral Risk Factor Surveillance System.
Normal Bell Curve

Students with IEP mean 68.3

All Students Measured

mean 63.9

Students without IEP mean 62.4
In a healthy population of children, when assessing aggregate BMI data, we expect the average, or mean, to be “50” based on a normal bell shaped curve.

**Student Mean BMI from this study**

*Without IEP  62.4*

*With IEP  68.3*

The average child in our study weighs more than would be expected in a healthy population, and children with IEPS are even heavier for their height, age and gender, than the students without IEPs.
BMI Comparison of Health Fundango Students by IEP Status 2012

Figure 6c. Mean BMI percentiles by IEP status across school age groupings for all participating Missoula schools

(n=1,889) IEP = 499  No IEP = 1,390

<table>
<thead>
<tr>
<th>School Age Grouping</th>
<th>No IEP</th>
<th>IEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary School Ages</td>
<td>61.8</td>
<td>67.1</td>
</tr>
<tr>
<td>Middle School Ages</td>
<td>64</td>
<td>68.2</td>
</tr>
<tr>
<td>High School Ages</td>
<td>61.3</td>
<td>71.4</td>
</tr>
</tbody>
</table>
BMI Trended Upwards in with Age for Health Fundango Students with IEP

![Graph showing BMI trended upwards with age for All Students With IEP 2012.](image)

- Trend-line begins:
  - Age 5  BMI 15
  - Age 19  BMI 27

- Total students: 490
Prevalence of Overweight and Obesity
Students Without IEP n= 575

Prevalence of Overweight and Obesity
Students With IEP n=67

Prevalence of Overweight and Obesity, by Sex
Students Without IEP  n=575  boys-316; girls-259

Prevalence of Overweight and Obesity, by Sex
Students With IEP  n=67  boys-43; girls-24
“This suggests to us that policies support healthy nutrition and routine physical activity are urgently needed for all students, and even more urgently needed for children with special needs.”

http://www.hsph.harvard.edu/obesity-prevention-source/
National Obesity Trends by Age

Years 2010-2020 growth trending was calculated using an upward exponential non-seasonal trend analysis.

This data is a close approximation of what the future of childhood obesity data could result in should the upward trends continue without interventions.
Differences in BMI for Children with Special Needs

The problem is particularly serious among young teens and “tweens.”

The CDC has found that:

• **18%** of children age 10-14 without disabilities are obese
• **30%** of children age 10-14 with disabilities are obese
Nationally, different kinds of disabilities provide their own particular challenges. An analysis of N-HANES data for ages 10-14 from 1999-2002 produced striking results:

80.6% of children with functional limitations on physical activity were either overweight or obese

50.8% of children receiving special education services were either overweight or obese

44% of children with attention deficit disorder (ADD) were either overweight or obese

# Differences in Body Composition

## Comparison of Obesity Between Youth (12–18 yrs) With Disabilities and Without Disabilities by Disability Type

<table>
<thead>
<tr>
<th>Disability Type</th>
<th>Youth w/ disability(a)(N=461)</th>
<th>Youth w/o disability(b)(N=12,973)</th>
<th>Adjusted Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Autism</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Obese (&gt;95% tile)</td>
<td>24.6</td>
<td>13.0</td>
<td>2.19</td>
<td>1.44-3.31</td>
</tr>
<tr>
<td>% Overweight (&gt;85% tile)</td>
<td>42.5</td>
<td>28.8</td>
<td>1.84</td>
<td>1.28-2.64</td>
</tr>
<tr>
<td><strong>Down syndrome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Obese (&gt;95% tile)</td>
<td>31.2</td>
<td>13.0</td>
<td>3.00</td>
<td>1.86-4.81</td>
</tr>
<tr>
<td>% Overweight (&gt;85% tile)</td>
<td>55.0</td>
<td>28.8</td>
<td>3.01</td>
<td>1.95-4.66</td>
</tr>
<tr>
<td><strong>Intellectual Disability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Obese (&gt;95% tile)</td>
<td>12.4</td>
<td>13.0</td>
<td>0.96</td>
<td>0.51-1.81</td>
</tr>
<tr>
<td>% Overweight (&gt;85% tile)</td>
<td>27.2</td>
<td>28.8</td>
<td>0.93</td>
<td>0.58-1.49</td>
</tr>
<tr>
<td><strong>Spina Bifida</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Obese (&gt;95% tile)</td>
<td>18.6</td>
<td>13.0</td>
<td>1.61</td>
<td>0.66-3.93</td>
</tr>
<tr>
<td>% Overweight (&gt;85% tile)</td>
<td>64.5</td>
<td>28.8</td>
<td>4.50</td>
<td>2.16-9.41</td>
</tr>
</tbody>
</table>

\(a\)DRRP data; \(b\)2007 YRBS data Data were weight-adjusted by age, gender, and race using sample ranking so the proportion segments of age, gender, and race were matched between DRRP and YRBS data.
Why Are Children With Special Needs At Risk For Overweight?

- Differences in body composition
- Reduced physical activity
- Use of medications that increase appetite
- Parents may be over-permissive or over-restrictive regarding food and exercise
- U.S. lifestyle—media messages telling us to eat more calorie dense foods, use labor saving devices
- Health Care Providers may be hesitant to alienate special needs families by discussing weight issues
- Possible vitamin D inadequacy
Differences in Muscle Tone

**Hypotonia (low muscle tone, floppiness)**
Results in a lower resistance to muscle movement. The lower the resistance, the fewer calories burned during movement. Children with low muscle tone may also have more difficulty initiating movements against gravity.

**Hypertonia (high muscle tone, spasticity)**
Both types of muscle tone may lower caloric needs by limiting muscle movement. Lack of movement results in muscle atrophy and a lower lean body mass, which in turn reduces the number of calories burned even at rest.
Differences in Body Composition

Children born prematurely and those born small for gestational age have

- more abdominal fatness as teens and adults than children born at term with normal birth weights
- a higher risk for high blood pressure and type II diabetes as adults

Various disabilities are associated with higher BMI and greater fat to muscle ratios
Lack of Physical Activity

Children with special needs may have fewer opportunities for physical activity because of a need for more supervision or for adaptive equipment.

Children who are unable to walk burn fewer calories than those who walk.

Children who walk with braces and crutches or walkers actually burn more calories than typical children during actual periods of walking.
Some Medications May Increase the Appetite

Anticonvulsants:  
  Depakene

Anti-inflammatory medications:  
  Prednisone, Naprosyn, Tolectin

Antidepressant/antipsychotics:  
  Melloril, Valium, Zyprexa, Seroquel, Risperdol, Clozapine

Antihistamine:  
  Periactin

Hormones:  
  Birth control pills, Depoprovera, Megace, growth hormone
Over-Permissive or Restrictive Parenting

Parents may try to compensate their child for his/her medical or physical problem by allowing whatever they want to eat, or over controlling what they allow their child to eat.
Overweight Affects Quality of Life and Self Esteem

Research has shown that overweight children are more likely to be teased and to be targets of bullies.

Research on Health Related Quality of Life and children with developmental disabilities has shown progressive decreases in quality of life scores as BMI’s rise.

Overweight Becomes An Additional Disability

Overweight interferes with self care:
- Dressing oneself becomes difficult
- It’s hard to tie shoes
- Transfers from wheelchairs become more difficult
- Using the restroom by oneself may be impossible
Obesity Results in Health Risks and Complications

Increased risk of:

- High blood pressure
- Heart disease and arteriosclerosis
- Diabetes
- Post surgical complications
- Pressure sores
- Joint problems (foot, knee and hip)
- Blount’s disease
- Fatty liver disease
- Sleep apnea
Why do the BMI’s of school aged children tend to rise the older they get?
On average, children get 25% of their daily calories at school from competitive foods.

<table>
<thead>
<tr>
<th>Snacks Currently In Many Schools</th>
<th>Snacks Under Updated Nutrition Standards*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fudge Brownie</td>
<td>Baked Potato Chips</td>
</tr>
<tr>
<td>Chocolate Bar</td>
<td>Low-Fat Milk</td>
</tr>
<tr>
<td>Cranberry Juice Cocktail</td>
<td>Pretzels (Snack Size Package)</td>
</tr>
<tr>
<td>Ice Cream Sandwich</td>
<td>Yogurt</td>
</tr>
<tr>
<td>Regular Potato Chips</td>
<td>Apple</td>
</tr>
<tr>
<td>Chocolate Chip Cookies</td>
<td>Carrots (1 cup)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Serving Size 81g</td>
<td>Serving Size 28g</td>
</tr>
<tr>
<td>Serving Size 1.6 oz.</td>
<td>Serving Size 214g</td>
</tr>
<tr>
<td>Serving Size 12 fl. oz.</td>
<td>Serving Size 25g</td>
</tr>
<tr>
<td>Serving Size 71g</td>
<td>Serving Size 6 oz.</td>
</tr>
<tr>
<td>Serving Size 20g</td>
<td>Serving Size 125g</td>
</tr>
<tr>
<td>Serving Size 31g</td>
<td>Serving Size 125g</td>
</tr>
</tbody>
</table>

247 cals  235 cals  205 cals  173 cals  151 cals  140 cals  120 cals  102 cals  95 cals  90 cals  65 cals  49 cals
What are we doing to pull people from the river?
What are we doing to pull people from the river?

1. Bariatric surgery
2. Medicate to control diabetes and other chronic diseases
3. Sell club memberships, diets, exercise equipment
4.Legislate to require posting of calorie levels
5. Try to teach people how to read food labels
6. Ask restaurants to serve smaller portions
7. Talk about adding PE back into schools

But obesity rates are still rising and as of 2007, over 2/3 of the US population was overweight or obese.
Is it time to abandon the notion of personal choice in dietary counseling for obesity?

“Obesity is heavily influenced by genetic vulnerabilities and a toxic food environment.”
Neurobehavioral view of our brain & food cues

Delay discounting: Interaction between the red and blue areas.

Reward center

Inhibitory control

Dorsolateral prefrontal cortex

Nucleus accumbens

Ventral tegmental area
## A neurobehavioral model of personal choice in obesity

<table>
<thead>
<tr>
<th>Behavioral process</th>
<th>Neural basis</th>
<th>Impact on personal choice</th>
<th>Clinical implication(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food reward</strong></td>
<td>Mesolimbic dopamine system</td>
<td>Increases motivation to consume palatable food</td>
<td>Removing palatable food cues from personal environments (e.g., home, workplace) reduces overeating by preventing activation of reward circuitry</td>
</tr>
<tr>
<td><strong>Inhibitory control</strong></td>
<td>Prefrontal cortex, especially dorsolateral regions</td>
<td>Supports restraint from eating, which is a core component of weight management</td>
<td>Avoid situations (e.g., buffets, restaurants) that challenge inhibitory control</td>
</tr>
<tr>
<td><strong>Time discounting</strong></td>
<td>Interaction between mesolimbic system and prefrontal cortex</td>
<td>Immediate pleasure from eating has a greater impact on decision-making than delayed benefits of weight control</td>
<td>Focus on achievement of short-term goals (e.g., meeting a daily calorie goal) Advise patients to prepare healthy foods in advance to increase their accessibility relative to unhealthy convenience foods</td>
</tr>
</tbody>
</table>
A few strategies recommended by the neurobehavioral researchers include

**Address food reward.** Patients can remove high fat, high sugar foods they crave from personal environments such as the home, school and workplace to prevent the activation of the reward circuitry.

**Limit the impact of reward** on food choice by shopping with a grocery list or using online grocers.

**Assure that public places** such as parks, swimming pools, athletic events, have food and beverage standards so healthy choices are available and less expensive than the high calorie low nutrient choices.
Environments & behavior account for 70% of the US Health Expenditures. Prevention means redesigning environments for health.

Factors Influencing Health:
- Health Behaviors: 50%
- Environment: 20%
- Genetics: 20%
- Access to Care: 10%

Medical Services: 96%

Prevention: 4%

SOURCE: Blue Sky Initiative, University of California at San Francisco, Institute of the Future, 2000
What could we do to prevent our children from falling into the river?
The vitamins, minerals, and fiber in fruits and vegetables enhance growth, help us maintain a healthy weight and keep the immune system strong.

In the US, only 1 in five children eat 5 servings of fruits and vegetables each day. 25% of all vegetables consumed are French fries.

Add fresh or frozen fruits and vegetables to every meal and snack!
Screen time includes TV, computers, video games, and hand held devices.

Screen time =

decreased physical activity
increased snacking and
more exposure to junk food ads

US children ages 2-17 average 19 hours and 40 minutes watching TV weekly.
Active play is fun and important for a child’s health. Active kids will likely become active adults. Add physical activity to your daily routine.

It helps to build muscle and bone strength, manage body weight, lowers the risk of type 2 diabetes, reduces stress and put a smile on our faces.

Fewer than 16% of students get at least 20 minutes vigorous play 3 times a week.
Americans eat 132 pounds of sugar a year or 30 teaspoons a day. Sweetened drinks have about 1 teaspoon of sugar per ounce. Soda, sport drinks, chocolate milk and juice have a lot of sugar, which adds empty calories. These lead to tooth decay and replace milk in children's diets. Skim or 1 percent white milk is best for kids.
Particularly Good Resources........

What could we do to prevent children from falling into the river?
“It is unreasonable to expect that people will change their behavior easily when so many forces in the social, cultural, and physical environment conspire against such change. If successful programs are to be developed...attention must be given not only to the behavior of individuals, but also to the environmental context within which people live...”

Smedley and Syme, 2000