From Office to #IRL – Utilizing Technology & Social Media in Adolescent Obesity Management

Lonna Gordon, MD
Julie Nagpal, MD
Temitope Ademuwagun, MD
Caroline J. Barangan, MD
Disclosure

Dr. Gordon, Dr. Nagpal, Dr. Ademuwagun and Dr. Barangan disclose no significant financial relationships relevant to this educational activity.

They will not discuss “off-label” uses of drugs and/or devices during the presentation.

NO COMMERCIAL SUPPORT WAS PROVIDED FOR THIS ACTIVITY.
Objectives

By the end of the session, participants will be able to

• Describe best practices in providing obesity management to adolescent youth.

• Discuss the challenges in implementing best practices in obesity management into clinical practice.

• Demonstrate how technology including: websites, social media platforms, and apps can be utilized to reinforce nutritional topics discussed in the office and provide close follow-up once an obese adolescent has left the office.
Introduction

• Prevalence of overweight and obesity continues to increase among children and adolescents in the United States.
  – Overweight: excess body weight for a particular height from fat, muscle, bone, water, or a combination of these factors
  – Obesity: excess body fat

• Childhood obesity has doubled in children and quadrupled in adolescents in the past 30 years.
  – Percentage of obese adolescents (12-19 yo) has increased from 5% to 21% (1980 and 2012)
## Childhood Obesity Facts

### Current Obesity & Overweight Rates Among Children by Race and Ethnicity (2011-2012)

<table>
<thead>
<tr>
<th></th>
<th>ALL CHILDREN</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16.9%</td>
<td>14.9%</td>
<td>31.8%</td>
<td></td>
</tr>
<tr>
<td>BLACK</td>
<td>20.2%</td>
<td>12.3%</td>
<td>32.5%</td>
<td></td>
</tr>
<tr>
<td>LATINO</td>
<td>22.4%</td>
<td>16.5%</td>
<td>38.9%</td>
<td></td>
</tr>
<tr>
<td>WHITE</td>
<td>14.3%</td>
<td>14.2%</td>
<td>28.5%</td>
<td></td>
</tr>
</tbody>
</table>

Medical Impact of Obesity

Complications of Childhood Obesity

Psychosocial
- Poor self esteem
- Depression
- Quality of life

Neurological
- Pseudotumor cerebri
- Risk for stroke

Cardiovascular
- Dyslipidemia
- Hypertension
- Left ventricular hypertrophy
- Chronic inflammation
- Endothelial dysfunction
- Risk of coronary disease

Pulmonary
- Asthma
- Sleep apnea
- Exercise intolerance

Renal
- Glomerulosclerosis
- Proteinuria

Endocrine
- Type 2 diabetes
- Precocious puberty
- Polycystic ovary syndrome (girls)
- Hypogonadism (boys)

Gastrointestinal
- Pancreatitis
- Steatohepatitis
- Liver fibrosis
- Gallstones
- Risk for cirrhosis
- Risk for colon cancer

Musculoskeletal
- Forearm fracture
- Blunt's disease
- Slipped capital femoral epiphysis
- Flat feet
- Risk for degenerative joint disease

Hernia
- DVT/PE

Stress incontinence
Risk of GYN malignancy
Psychosocial Impact of Obesity

**Complications of Childhood Obesity**

- **Psychosocial**
  - Poor self esteem
  - Depression
  - Quality of life

- **Neurological**
  - Pseudotumor cerebri
  - Risk for stroke

- **Cardiovascular**
  - Dyslipidemia
  - Hypertension
  - Left ventricular hypertrophy
  - Chronic inflammation
  - Endothelial dysfunction
  - Risk of coronary disease

- **Renal**
  - Glomerulosclerosis
  - Proteinuria

- **Gastrointestinal**
  - Pancreatitis
  - Steatohepatitis
  - Liver fibrosis
  - Gallstones
  - Risk for cirrhosis
  - Risk for colon cancer

- **Musculoskeletal**
  - Forearm fracture
  - Blount’s disease
  - Slipped capital femoral epiphysis
  - Flat feet
  - Risk for degenerative joint disease

- **Endocrine**
  - Type 2 diabetes
  - Precocious puberty
  - Polycystic ovary syndrome (girls)
  - Hypogonadism (boys)

- **Pulmonary**
  - Asthma
  - Sleep apnea
  - Exercise intolerance

- **DVT/PE**
  - Stress incontinence
  - Risk of GYN malignancy
Consequences of Obesity - Psychological

The Obesity Stigma

- Low self-esteem
- Sloppy
- Linked to poverty
- Eating Disorders
- Depression
- Earn less money than slimmer co-workers
- Lazy

http://www.bellygonefat.com
Social and Economic Consequences

Gortmaker et al

• Prospective study, 1981-1988
• 10,039 adolescents and young adults
• Overweight women
  – Completed fewer years of school
  – Less likely to be married
  – Lower household incomes
  – Higher rates of household poverty
CHILDHOOD OBESITY

1/3 of all children and adolescents are overweight or obese.

Overweight adolescents have a 70 percent chance of becoming overweight adults.
Life Trajectories of Obese Adults

• Less likely to get hired and promoted
• Lower compensation for same job
• More likely to get fired
• Less likely to marry
• More likely to marry a partner who is less educated or less financially secure than themselves
• More likely to live in poverty
• Rate their health as lower and less likely to use healthcare resources citing provider discrimination

• Lower threshold for weight based discrimination for women at BMI of 27 compared to 35 for men
AAP Recommends

Healthy lifestyle counseling during well adolescent visits for all young adults regardless of BMI
Kharofa et al

• 60% of patients report that they do not receive counseling despite recommendations

• Only 20% of medical information communicated by the providers is remembered
Best Practices

• AAP Prevention Plus Guidelines
  – Buy fewer sugar-sweetened beverages, high-calorie snacks and sweets.
  – If you want to have these foods for a special celebration, buy them shortly before the event, and remove them immediately afterward.
  – Healthy foods and beverages (water, fruits, vegetables and other low-calorie snacks) should be readily available and in plain sight on the kitchen table or counter, or in the front of the shelf in the refrigerator.
  – High-calorie foods should be less visible – wrapped in foil rather than clear wrap, and placed in the back of the fridge or pantry.
  – Five or more servings of fruits and vegetables each day.
  – Physical activity: 60 minutes a day is recommended
Dietary Intakes Compared to Recommendations
Percent of the U.S. Population Ages 1 Year and Older Who Are Below, At, or Above Each Dietary Goal or Limit

Food Group or Dietary Component

- Vegetables
- Fruit
- Total Grains
- Dairy
- Protein Foods
- Oils
- Added Sugars
- Saturated Fats
- Sodium

NHANES 2007-2010
Best Practices

• Healthy People 2020 Nutrition Guidelines
  – Follow a healthy eating pattern across the lifespan.
  – Focus on variety, nutrient density, and amount.
  – Limit calories from added sugars and saturated fats and reduce sodium intake.
  – Shift to healthier food and beverage choices.
  – Support healthy eating patterns for all.
Physical Activity Guidelines

• Recommendations for ages 6 to 17 years
• Children and adolescents should do 60 minutes or more of physical activity daily.
  – Aerobic: Moderate or vigorous-intensity aerobic physical activity
    • Include vigorous-intensity physical activity at least 3 days a week.
  – Muscle-strengthening: At least 3 days of the week.
  – Bone-strengthening: A at least 3 days of the week.
  – Appropriate for age, enjoyable, and offer variety.
Challenges

Factors that contribute to childhood obesity:

• Genetics

• Metabolism—how your body changes food and oxygen into energy it can use

• Eating and physical activity behaviors

• Environmental factors

• Social and individual psychology
# Federal Nutrition and Physical Activity Resources

- Dietary Guidelines for Americans [www.dietaryguidelines.gov](http://www.dietaryguidelines.gov)
- Physical Activity Guidelines for Americans [www.health.gov/paguidelines](http://www.health.gov/paguidelines)
- MyPlate [www.choosemyplate.gov](http://www.choosemyplate.gov)
- SuperTracker [www.supertracker.usda.gov](http://www.supertracker.usda.gov)
- U.S. Department of Health and Human Services [www.hhs.gov](http://www.hhs.gov)
- Healthy People [www.healthypeople.gov](http://www.healthypeople.gov)
- Healthfinder [www.healthfinder.gov](http://www.healthfinder.gov)
- Food and Drug Administration [www.fda.gov](http://www.fda.gov)
- Centers for Disease Control and Prevention [www.cdc.gov](http://www.cdc.gov)
- President’s Council on Fitness, Sports & Nutrition [www.fitness.gov](http://www.fitness.gov)
- U.S. Department of Agriculture (USDA) [www.usda.gov](http://www.usda.gov)
- National Institute of Food and Agriculture [www.nifa.usda.gov](http://www.nifa.usda.gov)
- Let’s Move! [www.letsmove.gov](http://www.letsmove.gov)
- U.S. National Physical Activity Plan [www.physicalactivityplan.org](http://www.physicalactivityplan.org)
Challenges

• Adolescent must be motivated and prepared to make a health behavior change
• Concerns about neighborhood safety and access to outdoor areas for physical activity
• Most adolescents are dependent on their parents for transportation
  – Access to after-school activities and sources of extracurricular physical activity are limited
• Lack of time or resources = primary reason they are unable to be physically active
Challenges

• Concerns about bullying and negative peer interactions during school physical education classes
• Feelings of being “too out of shape” or experiencing physical discomfort during or after physical activity
• Nutritional behaviors are developed at an early age, with the influence of family eating practices and parenting styles
• Eating choices tend to be based on perceived distaste for healthy foods, lack of convenience, and lack of time
Attitudes towards Weight Counseling

• Adolescents prefer indirect conversations around weight.
  – Offering healthier food choices at home
  – Removing tempting foods
  – Suggesting and participating in a physical activity with them
  – Not directly mentioning that they have put on weight or should lose weight
  – Prefer communication that appears supportive and not judgmental
What Adolescent Girls Want to Hear

- An emphasis on how health relates to appearance not only weight.
- They do not like the words “control your weight”.
- Emphasis on eating to “be healthy”.
- Do not make them “feel bad” about themselves.
- Balance between health and weight control in education.
Healthcare Systemic Challenges

- Provider knowledge
- Provider bias - feeling that it stigmatizes patient
- Utility of Motivational Interviewing with Adolescents for Weight Management
  - Time consuming (each individual session and follow up sessions)
Perception: Physician Dietary Counseling

• Physicians routinely discuss weight with adolescents at well visits.
• They are more likely to discuss with those who are “at risk”.
• Physicians are more likely to bring up dietary counseling with patients who they fear will not bring it up.
• There is fear that discussing dietary counseling with patients who are a normal weight will trigger disordered eating.
Reasons Obesity Treatment is Avoided

1. Perception that there is not a weight management problem
2. Thought that adolescent already has a healthy lifestyle - no new info to be provided
3. Family does not intend to make recommended changes
4. Lack of motivation to participate
5. Situational barriers such as cost, time, transportation, weather, frequency
Areas of Knowledge Deficit

• How to create time to eat healthy?
• How to eat healthy in the current food environment?
High Yield Counseling Topics

• Sugar Sweetened Beverages
• Juice & Juicing
• Food Groups
• After School Snacking
• Restrictive Diets
  – Vegan/ Vegetarianism
  – Gluten Free
  – Paleo
High Yield Counseling Strategies

- Motivational Interviewing
- The 5 A’s
- Setting SMART Goals
- Accentuating the positive
- Emphasizing lifestyle over strictly calories
- Identifying techniques of past success
- Critiquing techniques of past relapse
Technology

- Technology can be utilized to incorporate nutritional guidance and obesity management into a busy practice
- Use of technology can increase adherence to set goals
- Adolescents love their tech!
TECHNOLOGY

How do you use it in your office for nutritional guidance and obesity management?
Patient-centered websites, apps, and social media platforms that support healthy weight loss
Apps Shall Lead the Way

- Smartphone apps hold promise in supporting health behavior change and weight management

- Growing interest in use of smartphones to deliver behavioral interventions for health because of their:
  - Low cost
  - Common
  - Easily Accessible
Quality of Apps

• A range of frameworks have been used to evaluate the quality of apps in management of:
  – Cancer
  – Diabetes
  – Smoking
  – Mental health
  – Headaches
  – Cardiology
  – Alcohol
  – HIV
  – Pain

• Many apps available for weight management, BUT few evaluations of the quality of weight-management apps
Proposed Framework for Evaluation

• Evaluation frameworks have included:
  – analysis of content source and expertise
  – information quality
  – app technology and design
  – user engagement and ease of use
  – behavioral theories
Chen et al

• Evaluated quality of the most popular dietary weight-loss smartphone apps on the commercial market
• Used comprehensive quality assessment criteria
• Quantified the behavior change techniques (BCTs) incorporated
Chen et al

• No prior widely accepted standards of quality evaluation for apps existed
• Pro forma evaluation based on a modified version of instrument developed by University of Sydney, Australia, and the University of Leeds, UK Collaboration
• Basic descriptive information:
  – Name of app
  – Developer
  – Version
  – Number of downloads
  – Average number of stars that the app was rated
  – Total number of ratings
  – Number of users who voluntarily rated it
  – Price
App Quality Assessment

- Accountability measures
- Scientific coverage and content accuracy
- Technology-enhanced features of healthy eating
- Accuracy of apps in assessing energy intake compared to a weighted food record (WFR)
App Quality Assessment

• Inclusion of any of 14 technology-enhanced features observed in previous app evaluations

• Usability measured by validated 10-item System Usability Scale (SUS)
  – 5-point Likert scale
  – Overall usability score of 0-100
App Quality Assessment

• Incorporation of behavior change techniques

  – 26-item categorized into:
    (1) motivational enhancing,
    (2) planning and preparation, and
    (3) goal striving and persistence
App Quality Assessment

Total score out of 100

- Scientific coverage and accuracy (32 points)
- Behavioral change techniques (26 points)
- Usability (20 points),
- Technology-enhanced features (14 points),
- Accountability (8 points).
Results of Assessment

- 28 apps were reviewed in detail
- 9 apps (32%) evaluated by both assessors.

Characterized into four categories:
- Calorie counters (17/28, 61%),
- Weight Watchers point system-based apps (5/28, 18%),
- Basic trackers which logged food or nutrients, but contained no energy calculations (4/28, 14%),
- Image-based meal trackers (2/28, 7%)
Relative ranking of popular dietary weight-loss smartphone apps.

<table>
<thead>
<tr>
<th>Rank</th>
<th>App</th>
<th>Acc. a</th>
<th>SCA b</th>
<th>TEF c</th>
<th>Us. d</th>
<th>BCT e</th>
<th>TS f</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Noom Weight Loss Coach by Noom, Inc (2010, USA)</td>
<td>5</td>
<td>28</td>
<td>9</td>
<td>19</td>
<td>14</td>
<td>75</td>
</tr>
<tr>
<td>2</td>
<td>Calorie Counter PRO by MyNetDiary, Inc (2010, USA)</td>
<td>3</td>
<td>27</td>
<td>6</td>
<td>17</td>
<td>12</td>
<td>65</td>
</tr>
<tr>
<td>6</td>
<td>Calorie Counter by SparkPeople (2012, USA)</td>
<td>8</td>
<td>20</td>
<td>8</td>
<td>15</td>
<td>10</td>
<td>61</td>
</tr>
<tr>
<td>9g</td>
<td>Calorie Counter by MyFitnessPal, Inc (2009, USA)</td>
<td>2</td>
<td>22</td>
<td>8</td>
<td>12.5</td>
<td>10</td>
<td>54.5</td>
</tr>
<tr>
<td>22</td>
<td>Point Tracker Weight Watchers by PointTracker</td>
<td>0</td>
<td>18</td>
<td>3</td>
<td>13</td>
<td>3</td>
<td>37</td>
</tr>
</tbody>
</table>
Noom Coach: Health and Weight

- A coach follows activity in the app and provides support through a structured program tailored to specific health goals.
- User can choose a variety coached programs
- Programs created by physicians.
- Some programs are designed to prevent or manage chronic conditions such as diabetes and hypertension.
- FREE, but in app purchases
- www.noom.com
Noom Coach

Start every day with a plan

Log your meals in seconds
Let's take a look
Calorie Counter
PRO MyNetDiary

- Weight loss requires several behaviors working in tandem:
  - Healthy diet
  - Proper sleep
  - Regular exercise.

- MyNetDiary allows you to track all of these in one place.
- SMALL COST
- www.mynetdiary.com
My Net Diary Pro

Mynetdiary tools:
- Food Check
- My Plan
- Before & After
- Community
- Mynetdiary Library
- Social Networks
- Settings
- Tips & Tricks
- Pro Guide

Today:
- Meals: Eaten: 80 cals
  Food Left: 1305 cals
- Exercises: 643 cals
- Weight: 225lb
- Charts
- Analysis: Remains: 1948 cals
- Water: 0 glasses
- Measurements: 1,486 steps
- Daily Notes
- Vitamins

Comparing foods:
- Singles american cheese 2% milk slices by kraft slice (19g)
- Velveeta velveeta cheese slices by kraft slice (21g)

Calories: 44 vs. 50
Food Score: 1.1 vs. -0.8

First food is clearly a better choice. First food has 6 fewer calories, higher food score, 1g less saturated fat, 130mg less sodium.
Let's take a look
Weight Loss Diet & Calorie Calculator
SparkPeople

• Track caloric intake and physical activity

• FREE, but in app purchases

• www.sparkpeople.com
Weight Loss Diet & Calorie Calculator
SparkPeople

Get support from our fun and helpful community.

Our tracking tools help you eat better and move more.

Simplified navigation makes the app easier & quicker to use.
Let's take a look
Calorie Counter & Diet Tracker by MyFitnessPal

- Log meals, track macronutrients, and see how daily exercise affects net calories

- FREE

- www.myfitnesspal.com
Calorie Counter & Diet Tracker by MyFitnessPal

<table>
<thead>
<tr>
<th>Meal</th>
<th>Calories</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>100 cal</td>
<td>Greek 100 Calories Blended Strawberry Yoplait, 1 container</td>
</tr>
<tr>
<td>Lunch</td>
<td>390 cal</td>
<td>Aunt Millie’s Homestyle 100% Whole Grain Bread, 2 slice (34 g)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Peanut Butter 16oz Jif - Creamy, 2 tbsp</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Squeeze Fruit Spread - Reduced Sugar Smuckers, 1 Tbsp</td>
</tr>
<tr>
<td>Water Consumption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td></td>
<td>2 cups</td>
</tr>
</tbody>
</table>

Finished logging for today
Let's take a look
Weight Watchers Mobile

- Foods assigned a point value
- Users track points value of food eaten
- Coaching available for extra fee
- Online community where user can post photos and share accomplishments with others who use the app.
- FREE, but in app purchases
- www.weightwatchers.com
Weight Watchers Mobile

Eat better and track your food and activity on the go

Celebrate your progress and milestones
Let's take a look
# Quick Comparison

<table>
<thead>
<tr>
<th>APP</th>
<th>Encourages Behavior Change</th>
<th>Chronic Conditions</th>
<th>Easy of Use</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noom Weight Loss Coach</td>
<td>+</td>
<td>+++</td>
<td>+</td>
<td>+/-</td>
</tr>
<tr>
<td>Calorie Counter PRO by MyNetDiary</td>
<td>++</td>
<td>-</td>
<td>++</td>
<td>+/-</td>
</tr>
<tr>
<td>Calorie Counter by SparkPeople</td>
<td>++</td>
<td>-</td>
<td>++</td>
<td>+/-</td>
</tr>
<tr>
<td>Calorie Counter by MyFitnessPal</td>
<td>++</td>
<td>-</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>Point Tracker Weight Watchers by PointTracker</td>
<td>+++</td>
<td>-</td>
<td>+++</td>
<td>+/-</td>
</tr>
</tbody>
</table>
Another Resource
Weight Loss Coach by Fooducate

• Losing weight through proper nutrition, regular exercise and education
• Tracking tool that is educational — helps patients understand the basics of nutrition and other complex topics, like how additives can affect your long-term goals.
• FREE
• www.fooducate.com
Track your food and exercise

Your Personalized Weight Loss Toolbox

Learn what’s really in your food
SMALL GROUP WORK
Goals

• Discuss scenarios describing challenges faced by providers of obesity management
• Develop strategies to overcome the challenge using the tools provided
QUESTIONS?
Resources & References

Resources & References

Contact Information

Lonna.gordon@mountsinai.org
Julie.Nagpal@nychhc.org
Temitope.ademuwagun@mssm.edu
Caroline.barangan@mountsinai.org