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Using a Community Engaged Approach to Develop a Healthy Lifestyle Intervention for Adolescents with Overweight & Obesity

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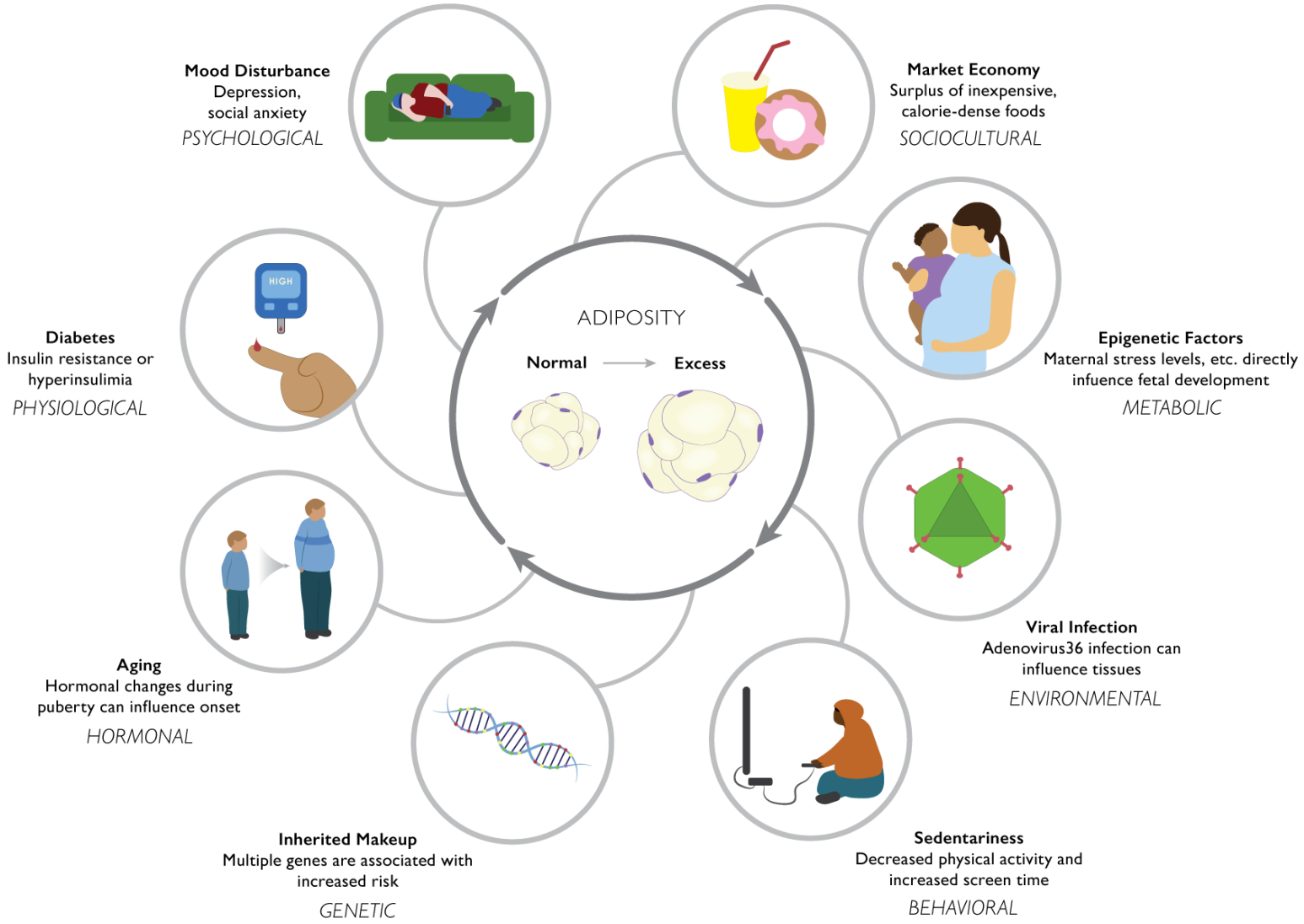
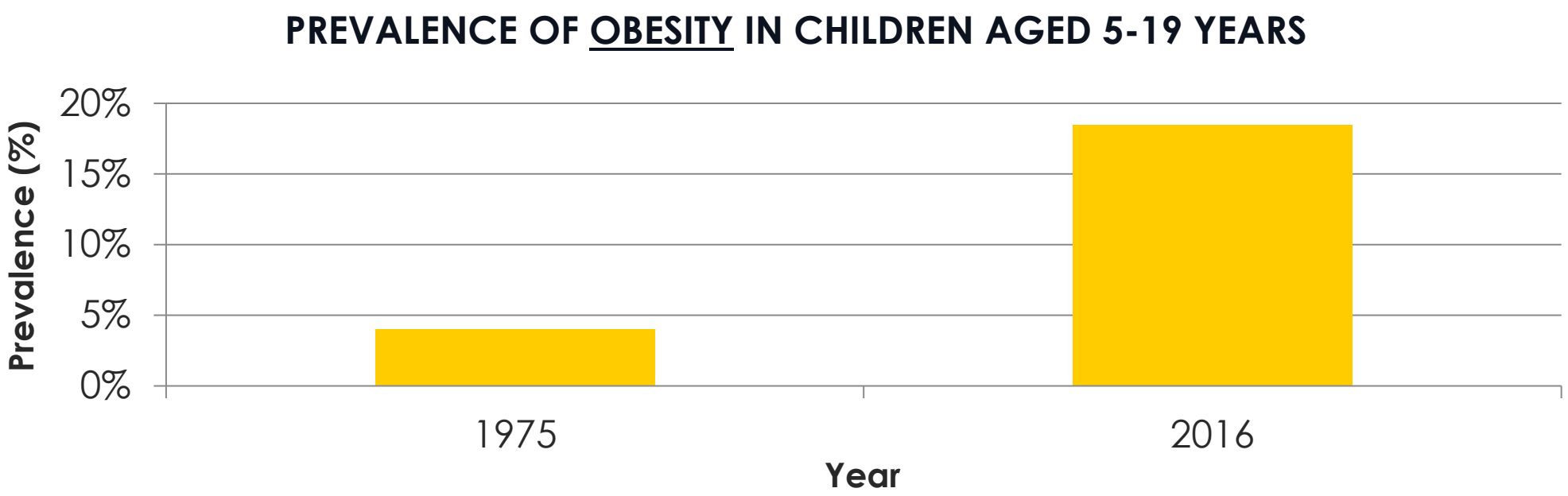
OBESITY: A MULTIFACTORIAL DISEASE



Cardel MI, Atkinson MA, Taveras EM, Holm J, Kelly AS. Obesity Treatment Among Adolescents: A Review of Current Evidence and Future Directions. *JAMA Pediatr*. 2020;174(6):609–617. doi:10.1001/jamapediatrics.2020.0085

CHILDHOOD OBESITY AROUND THE WORLD



18% of girls and 19% of boys were classified with obesity in 2016, while 6% of girls and 8% of boys had obesity in 1975.

World Health Organization: https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight
1 Apr 2020.

TREATMENT OPTIONS FOR OBESITY

Determined by child's age & degree of excess weight

- Behavioral Weight Management Program
  - Foundation across treatment modalities
- Pharmacotherapy
- Bariatric surgery (i.e., gastric bypass, sleeve gastrectomy, gastric banding)

Ells et al., 2018; Golan & Crow, 2004; Brei, 2014; Sherafat-Kazemzadeh et al., 2013.

U.S. PREVENTIVE SERVICES TASK FORCE TREATMENT RECOMMENDATIONS

- Screening ≥ 6 years for obesity

- Refer to comprehensive, intensive behavioral treatment
  - Inclusion of nutrition, physical activity, & behavior modification components
  - 26+ contact hours over a period of 2 to 12 months
  - > 52 contact hours w/in 12 months show more likelihood of effectiveness

Interventions to date appear to be equally effective for Latinos, African Americans, & non-Hispanic whites.

USPSTF (U.S. Preventive Services Task Force). (2017). **Screening for obesity in children and adolescents: U.S. Preventive Services Task Force recommendation statement.** *JAMA, 317*(23), 2417-2426.

CURRENT APPROACHES TO OBESITY MANAGEMENT

Family-Based Behavioral Treatment Programs

- Parents asked to model healthy eating behaviors
- Parents asked to modify parenting techniques during mealtimes
- Includes parental praise & positive reinforcement from parents to children
- Includes structured goals/rewards

Hayes, J. F., et al. (2016). **Decreasing food fussiness in children with obesity leads to greater weight loss in family-based treatment.** *Obesity*, *24*(10), 2158-2163.

COMPONENTS OF PEDIATRIC BEHAVIORAL WEIGHT MANAGEMENT INTERVENTIONS

- Lifestyle modifications
  - Dietary intake
    - Traffic Light Diet
  - Physical activity
    - ≥ 60 minutes of daily moderate-vigorous physical activity
    - No more than 2 hours of screen times
- Behavior change
- Often focused on the family

Steinbeck et al., 2018; Epstein & Squires, 1988; Ho et al., 2012; Ho et al., 2013; Oude Luttikhuis H et al., 2009; Diaz et al., 2010; O'Malley et al., 2017; Australian Government Department of Health, 2014; Department of Health (UK), 2011; The Public Agency of Canada, 2016; Office of Disease Prevention and Health Promotion, 2008.

Paucity of data within adolescent populations

- FBT current best practice for treatment of childhood obesity in children < 12 years
  - Paucity of data among adolescents
    - Current interventions were minimally effective for adolescents
      - More autonomous
      - Mixed data on parental involvement
      - Key time to develop self-regulation skills

How can we create interventions that are tailored for the needs and preferences of adolescents?

ACCEPTANCE-BASED THERAPY (ABT) WEIGHT LOSS INTERVENTION

Characterized by acceptance of uncomfortable states and emotions, mindfulness, values-based living & self-regulation skills

ABT in Adults

- Forman and Butryn at Drexel
- Components of Standard Behavior Therapy plus ABT
- Focus on mindfulness, values clarification, self-awareness, acceptance
- 13.3% Body Weight Loss over a 1-year period
- No difference by race, sex, or education

ACCEPTANCE-BASED THERAPY (ABT)

Characterized by acceptance of uncomfortable states and emotions, mindfulness, values-based living & self-regulation skills

Acceptance-Based Intervention for Overweight/Obesity in Adolescents
Funded by NHLBI K01 Career Development Award

- Use an adolescent-engaged approach to develop, tailor, and implement an Acceptance-Based Therapy Intervention to Adolescents

Goal: To create an intervention that targets components which could be salient for weight loss and improvements for self-regulation skills among adolescents, particularly those from low social status backgrounds.

PERCEIVED BARRIERS & FACILITATORS TO WEIGHT LOSS & HEALTHY LIFESTYLE AMONG ADOLESCENTS WITH OW/OB

- Adolescent boys and girls with OW/OB experience weight status differently
  - Different perceptions about weight status
  - Results in significant differences by sex regarding barriers and facilitators
- Need sex-stratified interventions

Bottom Line: Tailoring weight management interventions to the unique needs of adolescent females vs. adolescent males has potential to improve intervention feasibility, acceptability, and effectiveness.

Cardel MI, Szurek SM, Dillard JR, Dilip A, Miller DM, Theis R, Bernier A, Thompson LA, Dulin A, Janicke DM, Lee AM. Perceived Barriers/Facilitators to a Healthy Lifestyle among Diverse Adolescents with Overweight/Obesity: A Qualitative Study. *Obes Sci Pract*. 2020. 1-11.
Picture taken from Obesity Action Coalition Image Gallery

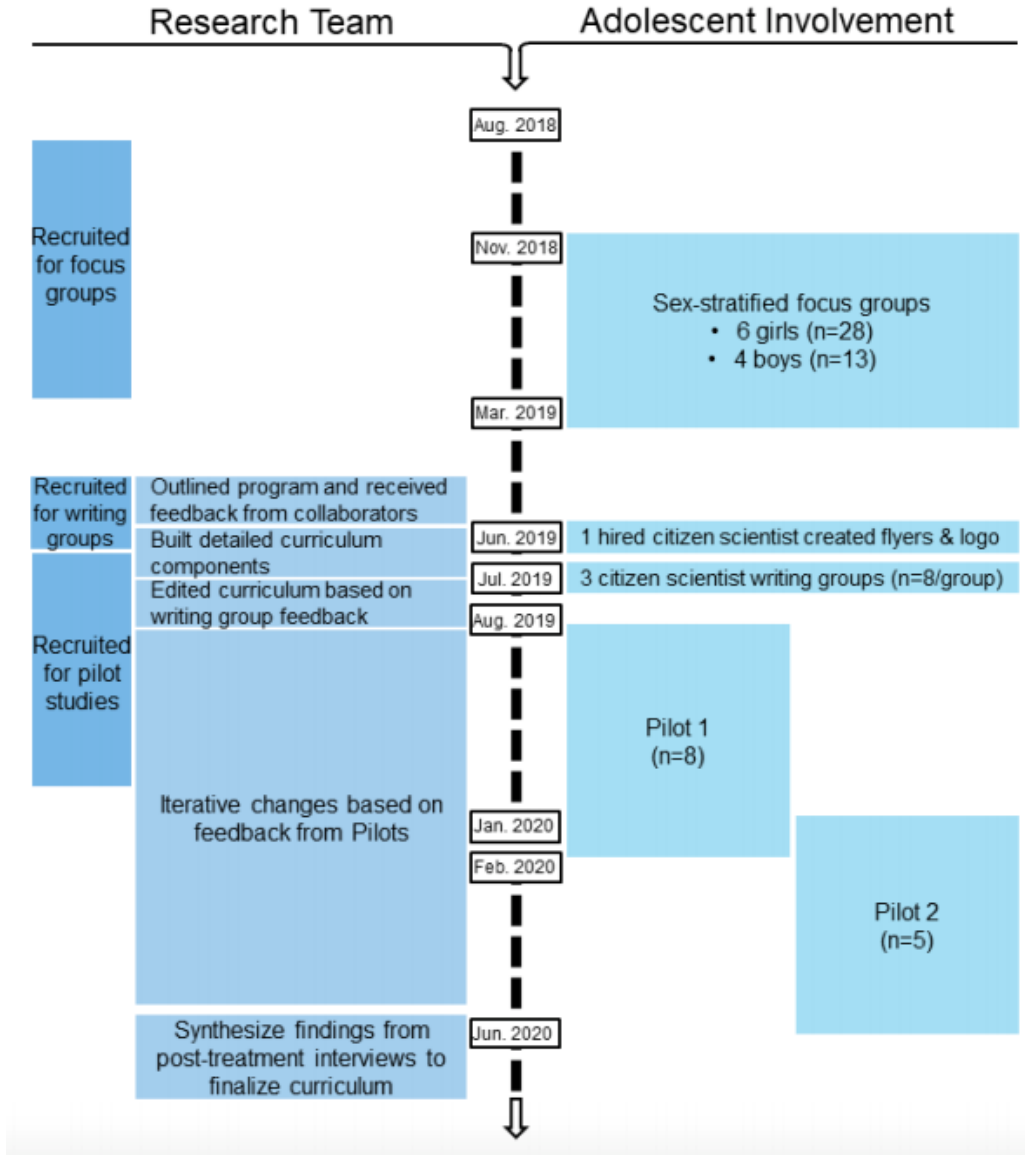
PREFERENCES OF ADOLESCENTS WITH OW/OB FOR BEHAVIORAL WEIGHT LOSS INTERVENTIONS

- Advised against programs solely focusing on "weight loss" and instead recommended emphasis be placed on "healthy lifestyle" terminology
  - Targets both physical and mental wellbeing of participants
  - Consistent with Canadian Medical Association guidelines
- Sex-stratified groups
- Relatable instructor with weight loss experience
- Optional parental involvement because some parents are perceived as helpful while others are a hindrance to success
- Identified incentives, engaging activities, and electronic communication as core components for program engagement and retention
  - Females place emphasis on socializing and relationship building

Lee AM, Szurek SM, Dilip A, Dillard JR, Miller DM, Theis R, Zaman N, Krieger J, Thompson LA, Janicke DM, **Cardel MI**. Preference of Adolescents with Overweight/Obesity for Behavioral Weight Loss Interventions. *Childhood Obesity*. E-pub ahead of print.
Photo from Obesity Action Coalition image gallery.

MIXED METHODS APPROACH TO DEVELOP THE WATCH PROGRAM

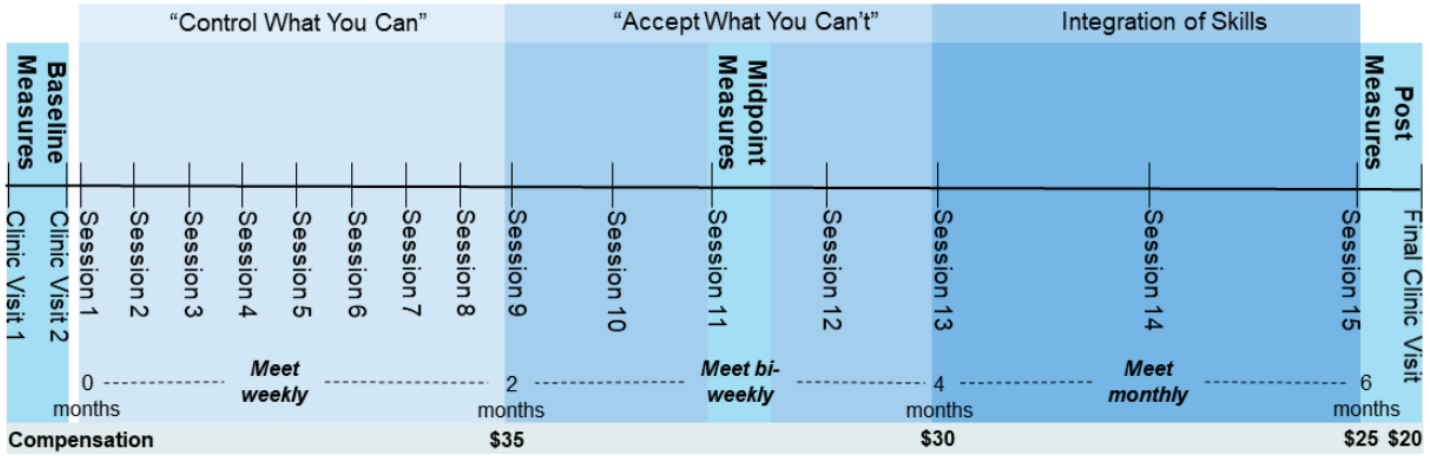
- Focus Groups
- Drafted curriculum
  - Tailored for adolescent girls
- Adolescent Citizen Scientists
- **Wellness Achieved Through Changing Habits** (WATCH©) Program for adolescent girls aged 14-19 years with a BMI ≥85th percentile-for-sex-and-age
- Feasibility Pilot with 2 Cohorts (n=13)



Lee AM, Miller DM, Janicke DM, Butryn ML, Pearson TA, Gurka MJ, **Cardel MI**. The Design and Implementation of an Acceptance-Based Healthy Lifestyle Program for Adolescent Girls with Overweight and Obesity. Under Review.

OUTLINE & DEVELOPMENT OF THE WATCH PROGRAM

- Healthy lifestyle program consisting of 15 group sessions over a 6-month period
  - Total of 22.5 direct contact hours and additional contact hours through supportive activities
    - GroupMe Chatgroup
  - Points for attendance
    - Incentives included water bottles, laptop stickers, t-shirts



Newsome F, Lee AM, Miller DM, Janicke DM, Butryn ML, Pearson TA, Gurka MJ, **Cardel MI**. The Design and Implementation of an Acceptance-Based Healthy Lifestyle Program for Adolescent Girls with Overweight and Obesity. Under Review.

FEASIBILITY & ACCEPTABILITY OF THE WATCH PROGRAM

- Thirteen enrolled in the pilot ABT intervention
  - >60% racial/ethnic minority
  - Eleven (84.6%) completed the 6-month intervention and assessments
  - 90.9% completed all 15 sessions over the 6-month intervention.

Variable	Change from Baseline to 6-Months (mean, SD,95% CI)	Cohen's d (95% CI)
BMI z-score	-0.15 (0.34), (-0.37, 0.08)	-0.44 (-0.73, -0.14)
% of 95th BMI percentile	-2.46 (7.02), (-7.18, 2.26)	-0.35 (-0.55, -0.15)
% Body Fat	-0.88 (2.54), (-2.83, 1.07)	-0.35 (-0.66, -0.03)
Quality of Life	4.74 (6.67), (0.26, 9.23)	0.71 (0.13, 1.29)
Experiential Avoidance	-12.91 (15.08), (-23.04, -2.78)	-0.86 (-1.47, -0.24)
Depression	-8.55 (9.89), (-15.19, -1.90)	-0.86 (-1.56, -0.17)
Perceived Stress	0.10 (6.24), (-4.37, 4.57)	0.02 (-0.91, 0.94)

Original Article | Open Access

Feasibility/Acceptability of an Acceptance-Based Therapy Intervention for Diverse Adolescent Girls with Overweight/Obesity

Michelle I. Cardel, Alexandra M. Lee, Xiaofei Chi, Faith Newsome, Darci R. Miller, Angelina Bernier, Lindsay Thompson, Matthew J. Gurka, David M. Janicke, Meghan L. Butryn

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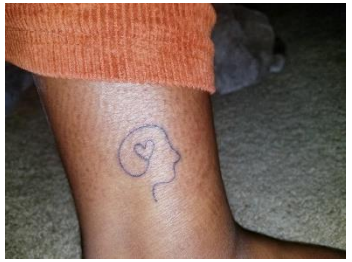
Cardel MI, Lee AM, Chi X, Newsome F, Miller DM, Bernier A, Thompson L, Gurka MJ, Janicke DM, Butryn ML. Feasibility/Acceptability of an Acceptance-Based Therapy Intervention for Diverse Adolescent Girls with Overweight/Obesity. *Obesity Science & Practice*. 2021. E-pub ahead of print.

FEASIBILITY & ACCEPTABILITY OF THE WATCH PROGRAM

- Qualitative feedback following each session and a semi-structured interview at the end of the intervention demonstrated high satisfaction with the program.



- Pilot RCT began August 2020 (virtual due to COVID19)
  - Pilot RCT paper being revised and resubmitted
  - Grant to be resubmitted for fully powered trial in July 2022

Bottom Line: Given high percent of weight loss observed in adults treated with ABT, combined with our pilot data demonstrating feasibility and acceptability, ABT could represent a highly effective obesity intervention for adolescents.

TREATING ADOLESCENT OBESITY

JAMA Insights | CLINICAL UPDATE

Treatment of Adolescent Obesity in 2020

Michelle I. Cardel, PhD, MS, RD; Ania M. Jastreboff, MD, PhD; Aaron S. Kelly, PhD

Treating the approximately 9 million US adolescents with obesity[1] is challenging because of the complex nature of this chronic disease. Adolescence is a critical period for managing obesity, owing to the dynamic physiological and psychological changes inherent to this period of growth and development. To identify and diagnose obesity, body mass index (BMI) for age and sex percentile should be assessed and tracked (**Table**)[2] and assessments for obesity causes, contributors, and complications should include a comprehensive weight, medical, surgical, social, and family history; medication review; physical examination; and laboratory tests.[3,4]

Consistent with other adolescent chronic diseases, choice of treatment should be guided by the patient's age and pubertal status, severity of obesity, psychosocial factors, and comorbidities.[2] Rather than proceeding by chronological stages or phases, treatment should occur as an integrated continuum of care that begins with the least invasive, yet appropriately intensive, treatment (Table). All options should be discussed with the family, and it is critical to use patient-first language and terms preferred by adolescents, such as *BMI*, and to avoid terms such as *fat* or even diagnostic terms such as *obese*.[5]

Behavioral Interventions

Comprehensive, intensive lifestyle modification is the cornerstone of obesity treatment for adolescents,[2,3] yet the magnitude of BMI reduction for this therapy alone is moderate, though potential

Pharmacotherapy

The US Food and Drug Administration has approved 2 medications for adolescent obesity: orlistat, a lipase inhibitor, for long-term use (for ages ≥12 years) and phentermine, a norepinephrine reuptake inhibitor, for short-term use (for ages ≥17 years) (Table).[6] In the largest of the randomized clinical trials examining orlistat, the placebo-subtracted BMI reduction at 52 weeks was 0.86 with orlistat.[7] A total of 64% of participants in the control group and 65% in the orlistat group completed the trial.[7] The most common adverse events in the orlistat group were gastrointestinal-related, with most reports being of mild to moderate intensity.[7] These adverse events included steatorrhea, fecal urgency, flatus with oily spotting, abdominal pain, and possible contribution to a vitamin D deficiency.[7] No randomized clinical trials of phentermine have been conducted in individuals younger than 17 years. However, common adverse effects observed in adults include tachycardia, hypertension, anxiety, insomnia, and headache.[6] With limited options for antiobesity pharmacotherapy in younger individuals and millions of patients falling into the treatment gap between suboptimal response to behavioral interventions and bariatric surgery, antiobesity medications approved by the US Food and Drug Administration for adults are being used off-label for adolescents.[6] These medications include metformin, GLP-1 analogues, phentermine, topiramate, naltrexone/bupropion, and lorcaserin.[6] Research on safety and efficacy of existing and new antiobesity pharmacotherapeutic

JAMA Pediatrics | Review

Obesity Treatment Among Adolescents
A Review of Current Evidence and Future Directions

Michelle I. Cardel, PhD, MS, RD; Mark A. Atkinson, PhD; Elsie M. Taveras, MD; Jens-Christian Holm, MD, PhD; Aaron S. Kelly, PhD

IMPORTANCE Obesity in adolescence has reached epidemic proportions around the world, with the prevalence of severe obesity increasing at least 4-fold over the last 35 years. Most youths with obesity carry their excess adiposity into adulthood, which places them at increased risk for developing obesity-driven complications, such as type 2 diabetes and cardiovascular disease, and negatively affects social and emotional health. Given that adolescence is a unique transition period marked by significant physiologic and developmental changes, obesity-related complications can also negatively affect adolescent growth and developmental trajectories.

OBSERVATIONS Provision of evidence-based treatment options that are tailored and appropriate for the adolescent population is paramount, yet complex. The multifactorial etiology of obesity along with the significant changes that occur during the adolescent period increasingly complicate the treatment approach for adolescent obesity. Treatment practices discussed in this review include an overview of evidence supporting currently available behavioral, pharmacologic, surgical, and device interventions for obesity. However, it is important to note that these practices have not been effective at reducing adolescent obesity at the population level.

CONCLUSIONS AND RELEVANCE Because adolescent obesity requires lifelong treatment, effectively addressing this disease will require significant resources, scientific rigor, and the provision of access to quality care similar to other chronic health conditions. Effective and less invasive therapies, effective adjuncts, and comprehensive centers that offer specialized treatment are critical. This considerable need for increased attention to obesity care calls for dedicated resources in both education and research for treatment of obesity in youths.

TREATING ADOLESCENT OBESITY

JAMA PEDIATRICS PATIENT PAGE

Becoming Your Healthiest Self: An Eat-Well, Get-Fit, Feel-Great Guide for Teens

Parents, empower your adolescents so they can make choices that promote their healthiest self.

Teens, getting older means making decisions about what matters to you most. Making healthy choices is a great place to start. Taking care of your physical, emotional, and mental health is what makes it possible for you to do all the things you want to do.

Fuel Up

You are in charge of what you eat and drink. The traffic light system can be a helpful tool in guiding your food and drink choices. It divides foods by the colors of a traffic light: green (anytime foods) is for low-calorie foods that are high in nutrients and can be eaten freely (fruits and vegetables); yellow (sometimes foods) is for foods that are high in calories but also high in nutrients (nuts, cheese, and grains); red (once-in-a-while foods) is for high-calorie foods that do not provide a lot of nutrients (desserts, fried foods, and soda). Eat on a smaller plate (like a salad plate) and make half of your plate fruits and vegetables. Make water your beverage of choice. If you are able, see a registered dietitian to help you achieve your nutrition goals.

Get Moving

Being active helps you to feel and sleep better. Aim for 60 minutes of physical activity a day. Most of the activity should make you breathe harder and get your heart rate up. Walking, biking, dancing, swimming, participating in organized sports, and weightlifting are a few ways to get moving and your heart pumping. The important thing is to find something you love to do and stick with it.

Chill Out

Teens often feel stressed by school, work, and other things that come up. You can manage your stress by exercising, eating a healthful diet regularly, and getting enough sleep. Engaging in relaxation techniques such as meditation and yoga and decreasing negative self-talk can reduce your stress. Make a date with yourself to do something you love each day that decreases stress. Activities such as yoga, reading, calling a friend, listening to music, writing, or spending time with a pet can help with stress management.

Catch Some Zzzs

Getting enough good-quality sleep is an important part of staying healthy. Aim for 8 to 10 hours of sleep each night. Remove televisions and screens from your room, including your cell phone.

FOR MORE INFORMATION

National Heart, Lung, and Blood Institute:
https://www.nhlbi.nih.gov/health/educational/wecan/tools-resources/weight-management.htm

US Department of Agriculture:
https://www.choosemyplate.gov/teens

Treatment of Adolescent Obesity in 2020:
https://jamanetwork.com/journals/jama/article-abstract/2752560

Set Goals

Learning how to set and stick to goals is an important life skill. First, identify your goal and write it down. List the things that need to be completed to obtain that goal, and start working on tasks that will help you toward that goal. When your goal has been met, treat yourself with a nonfood reward, such as spending the day with a friend, buying yourself a new water bottle, or going on a hike.

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Future Directions

As we move forward with personalized medicine, it is important to consider:

- Psychosocial components play a role in the development of obesity
  - Your zip code may be just as important as your genetic code

- The field of obesity
  - Utilize implementation science and community engaged approaches
    - "Nothing about us, without us"
  - Create interventions that are acceptable and effective in underserved groups

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PERSPECTIVE

WILEY Obesity Science and Practice

Biobehavioural approaches to prevention and treatment: A call for implementation science in obesity research

Kathryn A. Kaiser[1,2] | Tiffany L. Carson[2,3] | Emily J. Dhurandhar[4] | William H. Neumeier[5] | Michelle I. Cardel[6]

Final Thoughts

"When wealth is passed off as merit, bad luck is seen as bad character. That is how ideologues justify punishing the sick and the poor. But poverty is neither a crime nor a character flaw. Stigmatize those who let people die, not those who struggle to live."
-Sarah Kenzior

Final Thoughts

"You may live in the world as it is, but you can still work to create the world as it should be."
-Barack Obama

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THANK YOU!

Please feel free to contact me with any comments or questions:

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