Healthcare Disparities in Obesity Treatment

FATIMA CODY STANFORD, MD, MPH, MPA, FAAP, FACP, FTOS
OBESITY MEDICINE & NUTRITION, MGH WEIGHT CENTER
AMERICAN BOARD OF OBESITY MEDICINE DIPLOMATE
### Objectives

<table>
<thead>
<tr>
<th>Discuss</th>
<th>Discuss racial and ethnic disparities in the prevalence, treatment, and pathophysiology of obesity.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explore</td>
<td>Explore issues surrounding obesity and socioeconomic status, education level, weight perception, provider diagnosis, and medical expenditures in obesity.</td>
</tr>
<tr>
<td>Understand</td>
<td>Understand differences in response to treatment of racial and ethnic minorities with regards to pharmacotherapy and weight loss surgery.</td>
</tr>
</tbody>
</table>
Prevalence\(^1\) of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2011

Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.

* Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.

\(^1\) Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.
Prevalence* of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2012
Prevalence\(^\text{\textcircled{1}}\) of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2013
Prevalence of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2014
Prevalence of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2015
Prevalence of Self-Reported Obesity Among Non-Hispanic White Adults, by State and Territory, BRFSS, 2013-2015
Prevalence of Self-Reported Obesity Among Hispanic Adults, by State and Territory, BRFSS, 2013-2015
Prevalence of Self-Reported Obesity Among Non-Hispanic Black Adults, by State and Territory, BRFSS, 2013-2015
Mean (95% CI) abdominal visceral adipose tissue (VAT) area (top panels) and subcutaneous adipose tissue (SAT) area (bottom panels) in African American and white men and women aged <45 and ≥45 y.
Ethnic and sex differences in visceral, subcutaneous, and total body fat in children and adolescents

![Graph showing differences in visceral and subcutaneous fat by age and ethnicity]
Regulation of Food Intake

http://www.cellbiol.net/ste/alpobesity2.php
Regulation of Food Intake
Central Nervous System regulates weight
BDNF Regulation and Obesity
Genome-wide analysis - African-specific variant in SEMA4D associated with body mass index

![Bar chart]

Obesity
13 MAR 2017 DOI: 10.1002/oby.21804
Foreign Born Persons Have Lower Likelihood of Obesity than those Born in the US

National Health Interview Survey 1997-2005

<table>
<thead>
<tr>
<th>Ethnicity/ Nativity Status</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Born White</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>US Born Black</td>
<td>1.4</td>
<td>2.09</td>
</tr>
<tr>
<td>US Born Hispanic</td>
<td>1.53</td>
<td>1.51</td>
</tr>
<tr>
<td>Foreign Born White</td>
<td>0.63</td>
<td>0.62</td>
</tr>
<tr>
<td>Foreign Born Black</td>
<td>0.55</td>
<td>1.22</td>
</tr>
<tr>
<td>Foreign Born Hispanic</td>
<td>0.72</td>
<td>0.83</td>
</tr>
</tbody>
</table>

Barrington DS et al. Obesity 2010
Women with Lower Income have Higher Obesity in the US

Ogden CL et al. NCHS Data Brief 2010
Non-Hispanic Black and Mexican American Men have Higher Obesity Rates at Higher Income Levels

<table>
<thead>
<tr>
<th>Ethnic Group</th>
<th>Low Income</th>
<th>Middle Income</th>
<th>High Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic Black</td>
<td>29%</td>
<td>36%</td>
<td>45%</td>
</tr>
<tr>
<td>Mexican American</td>
<td>30%</td>
<td>31%</td>
<td>41%</td>
</tr>
</tbody>
</table>

Ogden CL et al. NCHS Data Brief 2010
Non-Hispanic Black Men Who Graduate From College or High School Have More Obesity

<table>
<thead>
<tr>
<th>Ethnic Group</th>
<th>College Grad</th>
<th>Some College</th>
<th>High School Grad</th>
<th>&lt; High School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic White</td>
<td>28%</td>
<td>35%</td>
<td>34%</td>
<td>34%</td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>41%</td>
<td>35%</td>
<td>31%</td>
<td>43%</td>
</tr>
<tr>
<td>Mexican American</td>
<td>34%</td>
<td>34%</td>
<td>33%</td>
<td>29%</td>
</tr>
</tbody>
</table>

Ogden CL et al. NCHS Data Brief 2010
Non-Hispanic Black Men and Women are more Likely to Underestimate BMI

Comparison of self-described BMI with measured BMI

Hendley Y et al. Journal of Women’s Health 2002
Ethnic Minority Adolescents are More Likely to have Discordant Weight Perception

<table>
<thead>
<tr>
<th>Race/ Ethnicity</th>
<th>% with Discordant Weight Perception</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic White</td>
<td>27%</td>
</tr>
<tr>
<td>Native American</td>
<td>34%</td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>31%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>32%</td>
</tr>
<tr>
<td>Asian/ Pacific Islander</td>
<td>31%</td>
</tr>
<tr>
<td>Mixed Race</td>
<td>31%</td>
</tr>
</tbody>
</table>

Park E. Journal of School Health 2011
Ethnic Minorities are Less Commonly Diagnosed as Overweight/Obese

NHANES 1999-2004 for Persons with BMI>30

<table>
<thead>
<tr>
<th>Race/ Ethnicity</th>
<th>Odd Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic White</td>
<td>1.0</td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>0.6</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Davis NJ et al. Obesity 2009
Ethnic Minorities have Smaller Response to Weight Loss Pharmacotherapy

<table>
<thead>
<tr>
<th></th>
<th>Sibutramine</th>
<th>Orlistat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic Whites</td>
<td>-4.4kg</td>
<td>-2.8 kg</td>
</tr>
<tr>
<td>Ethnic Minorities</td>
<td>-2.7 kg</td>
<td>-2.3 kg</td>
</tr>
</tbody>
</table>

Osei-Assibey et al. Diabetes, Obesity, and Metabolism 2011
African-Americans Achieve Less Weight Loss After Bariatric Surgery

Mean Absolute Difference in Estimated Weight Loss in Caucasians versus African-Americans

-8.4%

% Estimated Weight Loss

Admiraal WM et al. Diabetes Care 2012
Potential Reasons for Ethnic Disparities in Obesity

- ↑↑ Energy Intake
- ↓ Energy Expenditure
- ↑↑ Life Stressors
  - Racism
  - Lack of Career Options
  - Family Illness/Death
- Cultural Influences
- Genetics

Johnston DW et al. Demography 2011
Johnson P et al. ABNF 2012
Factors which affect access to weight loss surgery

- Race
- Age
- Sex
- SES
- Location
- Referral

Jackson et al. Systematic Reviews 2014, 3:15
Access to RYGB in the United States

108,333 patients

- 79% white
- 12% black
- 9% Hispanic

Black patients

- Higher BMI
- More likely to have HTN

Serious Adverse Events

- Higher in Blacks (3.65%)
- Hispanics (3.19%)
- Whites (2.01%)

Are minorities less likely to proceed with weight loss surgery?

- 651 patients at 2 academic medical centers in Boston
- Evaluated whether racial and ethnic minorities were less likely to proceed with weight loss surgery
- Once referred, racial and ethnic minorities just as likely to proceed with surgery as their non-white counterparts
- Comorbid illness burden was similar, but there was difference in baseline BMI

Stanford FC et al. Surgical Endoscopy 2015
What accounts for difference in response from weight loss surgery?

- Demographics
- Clinical (BMI, comorbidities, QOL)
- Behavioral (Eating, PA, ETOH intake)

Wee CC et al. Obesity Surgery 2017
Case #1

- 58 year old African-American woman

**Past medical history:**
- Hypertension
- GERD
- Depression

**Diet:**
- Breakfast: Scrambled eggs with spinach, onions, peppers, or sausage; OR Oatmeal with nuts/ blueberries/ blackberries
- Snack: Fruit; Protein Bar (KIND bars of Jif creamy peanut butter)
- Lunch: Leftovers (Baked chicken, vegetables, brown rice)
- Snack: Almonds, Protein Bar
- Dinner: Baked chicken, vegetables, brown rice

**Exercise:** 4 days a week (1 hour); 2 days of cardio; 2 days of strength (meets with trainer twice a week)

**Sleep:** 6-7 hours (feels well rested)

**Stress:** Normal

**Post partum weight retention; Night Shift Nurse for 4 years**
58 year old woman

BMI: 34
BMI: 27.5
82% EBWL/
22% TBWL
Phentermine
+Topiramate
Case #2

- 49 year old Hispanic woman
- **Past medical history:**
  - Anxiety/Depression
  - Ventricular tachycardia s/p ablation
  - Mixed connective tissue disease
  - Hypertension
  - GERD

- **Diet:**
  - Breakfast: Fruit, Vitamins
  - Snack: Vitamin Water, Sobe Life Water, Fruit
  - Lunch: Lettuce (romaine and iceberg); cheese; ham, tomato, peppers, lite Italian dressing, OR vinegar/oil
  - Snack: Fruit (sometimes)
  - Dinner: Spinach, Smart Ones
  - Snack: Denies

- **Exercise:** Walking, some form of cardio, Walks 5 miles a day, Goes to Planet Fitness (Elliptical); Zumba (1 times per day; 7 days a week)

- Weight gain became prominent after childbirth (10 lbs. with each pregnancy X6); tobacco cessation, with metoprolol
49 year old woman

- BMI: 52
- 87.3% EBWL
- 45% TBWL
- VSG
Case #3

- 67 year old African-American woman
- **Past medical history:**
  - Type 2 Diabetes Mellitus
  - Hypertension
  - CAD
  - CHF
  - NASH
  - Breast Cancer
  - GERD

- **Diet:**
  - Breakfast: Regular Yogurt with Fruit (may snack)
  - Snack: Occasionally popcorn
  - Lunch: Chicken or Fish with vegetables and/or fruit
  - Snack: Fruit (apple, oranges, and watermelon)
  - Dinner: Fish (Haddock, Tilapia) or Chicken with occasional vegetables
  - Snack: Nuts

- **Exercise:** Walking, some form of cardio; 1/2 hour per day; joined a gym (started on the treadmill)

Weight gain became prominent in peri-menopause
67 year old woman s/p VSG

BMI: 40

67 year old woman s/p VSG

BMI: 23.5

109% EBWL/45% TBWL

115 lb5 (BMI of 25)

BMI: 23.5

115 lb5 (BMI of 25)
30 year old woman s/p RYGB

86% EBWL/41.5% TBWL

BMI: 48.5
BMI: 28
BMI: 32
BMI: 28
BMI: 22

Bupropion/Naltrexone

137 lbs (BMI of 25)
45 year old woman s/p VSG

BMI: 58
24% EBWL/14% TBWL

BMI: 50

BMI: 38

Phentermine/Zonisamide
59% EBWL/34% TBWL
59 year old woman s/p RYGB

BMI: 42
91% EBWL/35% TBWL

BMI: 26.5

BMI: 38

BMI: 25

BMI: 48

Bupropion/Zonisamide/Metformin

89% EBWL/34.7% TBWL
Summary

- Obesity is a Multi-factorial disease process
- Regulation of food intake is complex
- ↑ Prevalence of Obesity in Ethnic Minorities
- ↓ Prevalence of Obesity in Foreign Born
- Persons vary with response to education level and obesity
- Ethnic Minorities are more likely to have discordant weight perception
- Health Care Providers are less likely to diagnose ethnic minorities with overweight/obesity
- Ethnic minorities have less pronounced response to weight loss surgery and pharmacotherapy
Action Items

- Steps should be taken to ascertain etiology of higher prevalence of obesity in ethnic minorities
- Health care providers should be more vigilant about giving appropriate diagnosis of overweight/obesity in ethnic minorities
- Strategies should be employed to address disparities in prevention and treatment of obesity in ethnic minorities
Thank You For Your Time

Fatima Cody Stanford, MD, MPH, MPA, FAAP, FACP, FTOS
fstanford@mgh.harvard.edu
@fstanfordmd
@fatimacodystanford