Role of Causes and Contributors of Obesity

Dr. Nik Dhurandhar
Professor & Chair, Department of Nutritional Sciences
Helen Devitt Jones Endowed Chair
Texas Tech University, Lubbock, TX
Key Point 1: Define “Obesities”

A collection of diseases with multiple causes, contributors, and clinical expressions
“Obesity is generally caused by eating too much and moving too little.”
“(obesity develops...) as a result of poor diet and lifestyle choices.”

https://www.nhs.uk/conditions/obesity/causes/
• Swelling (edema), is not caused by drinking excessive water, but due to impairment in water balance regulation

• Obesity is due to impairment in energy balance regulation
In a healthy state, body fat is maintained within a range.

- Insufficient Fat Storage
  - Impaired reproduction

- Healthy Fat Storage

- Excess Fat Storage
  - Impaired reproduction

- Metabolic Rate
  - Hunger
  - Fullness
In people with obesity, this homeostatic system is impaired or overwhelmed.
Obesity is caused by an inability of the body to maintain fat within a healthy range.
<table>
<thead>
<tr>
<th>Causes</th>
<th>Contributors</th>
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<tbody>
<tr>
<td>Intrinsic</td>
<td>Extrinsic</td>
</tr>
<tr>
<td>Can induce obesity without contributors</td>
<td>Can lead to obesity in presence of causes</td>
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<tr>
<td>Non-preventable, treatable</td>
<td>Preventable, modifiable, treatable</td>
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Causes of Obesity

- Genes: e.g. Leptin, MC4R
- Hormones: e.g. thyroid, hunger, satiety
- Brown fat
- Fat oxidation
- Infections
- Environmental chemicals

Contributors
- Energy dense food
- Large portions
- Ultra processed food
- Sleep duration & quality
- Physical activity
- Psychological health
- Tobacco cessation
- Food insecurity

Causes
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Obesity

Contributors (Extrinsic)

- Structural Racism
- Low SES
- Food Insecurity

Cause (Intrinsic)

- Stress → Hormone disruption

Obesity
Contributors (Extrinsic):
- Structural Racism
- Low SES
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Cause (Intrinsic):
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Obesity

Future Generations
Contributors (Extrinsic)

- Structural Racism
- Low SES
- Food Insecurity

Cause (Intrinsic)

Stress → Hormone disruption

Obesity
185 million adults with overweight or obesity in the US

Obesity in an individual is not spontaneously reversible without a substantial and sustained negative energy balance.

Treatment of individuals affected with obesity is imperative.

On a community or national level, addressing contributors may prevent or minimize further expression of obesity.
Key Point 2:
Obesity treatment requires substantial, chronic negative energy balance
General weight loss suggestions do not produce meaningful weight loss

Placebo groups of weight loss drug trials

• Counseling for diet and physical activity.
• Eat less, move more, eat smaller portions, less fat, etc.

→ 1 – 2% weight loss after 1 year treatment.
Unstructured weight loss instructions are less likely to succeed

• Unfamiliarity with calorie requirement and daily variation
• Unfamiliarity with calorie value of food or physical activity
• Body resists weight loss (↓ RMR & satiety ↑ hunger)
• Negative energy balance is difficult to achieve or sustain
Emphasis on a single food item = Digging a hole in water
Individualized & structured treatment is needed for people with obesity
Key Point 3: Addressing obesity meaningfully requires

1) Individualized, effective, wide scale treatment
2) Minimizing or preventing additional expression
Addressing obesity in individuals

<table>
<thead>
<tr>
<th>Facilitating obesity management for individuals</th>
<th>System-wide changes</th>
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</thead>
<tbody>
<tr>
<td>• Identify and address operating cause(s) in individuals</td>
<td>• Minimize maintaining contributors</td>
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  e.g., Poor sleep: Address sleep apnea

  e.g. Poor sleep: Address conditions leading to disturbed sleep
# Addressing obesity effectively

<table>
<thead>
<tr>
<th>Enabling reduction in energy intake for individuals</th>
<th>System-wide changes</th>
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</thead>
<tbody>
<tr>
<td>• Personalized diet for negative energy balance</td>
<td>• Promoting conducive environment</td>
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<tr>
<td>e.g. Development of effective tools and strategies, diets, drugs and surgery, devices</td>
<td>e.g. Awareness, screening, access to care, availability and access to lower energy density food options, taste and cost considerations</td>
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## Addressing obesity effectively

<table>
<thead>
<tr>
<th>Promoting increase in energy expenditure for individuals</th>
<th>System-wide changes</th>
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<tr>
<td>• Physical activity (PA) promotion</td>
<td>• Resources to encourage PA</td>
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<tr>
<td>e.g. personalized PA prescription, approved drugs / devices</td>
<td>e.g. Policies, resources, awareness, easy access to facilities,</td>
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### Addressing obesity on a wider scale

<table>
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<tr>
<th>Making obesity management widely available for individuals</th>
<th>System-wide changes</th>
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<tr>
<td>• Inclusion of PCPs in addition to obesity specialists</td>
<td>• Obesity management training in med school</td>
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<td>• Greater and better tools to manage obesity</td>
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<td>• Insurance coverage</td>
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<td>• Access to care</td>
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<tr>
<td>e.g. inclusion of physicians, NP, PA, RD</td>
<td>e.g. Policies, resources, awareness, easy access to facilities, reducing barriers</td>
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Minimizing or preventing obesity expression

<table>
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<tr>
<th>Minimizing or preventing weight gain or regain in individuals</th>
<th>System-wide changes</th>
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<td>• Identify additional risk factors for obesity development.</td>
<td>• Resources to minimize risk factors for obesity expression</td>
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<tr>
<td>• Identify at-risk individuals.</td>
<td>e.g. reducing structural racism, food insecurity, economic stability,</td>
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<tr>
<td>e.g. screening for gene defects, hypothyroidism,</td>
<td></td>
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SUMMARY

• Obesities have causes (intrinsic) and contributors (extrinsic)

• Effective obesity treatment of an individual requires structured and personalized treatment

• Effectively addressing obesity on a community and national level will need:
  a) Effective and wide scale obesity treatment of individuals, and supporting system-wide changes
  b) Preventing excess weight gain or regain in at-risk individuals, and by minimizing system-wide risk factors for obesity expression
Thank you !