Can food be addictive?
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Chair of Obesity Matters
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Presenter Disclosure

Speaking engagements with Novo Nordisk
Learning Objectives

1. Define Food Addiction
2. Can Food be Addictive?
3. Yale Food Addiction Scale (YFAS)
4. Treatment Strategies

Define Food Addiction
Food Addiction (FA) Defined

Food addiction is the loss of control over the ability to stop eating certain foods as the body has become dependent on them.

Scientifically, food addiction is a cluster of chemical dependencies on specific foods or food in general. After the ingestion of highly palatable foods such as sugar, excess fat, flour, grains and/or salt, the brains of some people develop a physical craving for these foods.

Over time, the progressive eating of these foods distorts their thinking and despite negative consequences they are unable to stop the behavior.

Food addiction is a DIFFERENT disease than non-substance dependent obesity and eating disorders.

Food addiction requires a DIFFERENT approach to treatment.

Source: Food Addiction Institute

How Common is Food Addiction?

88.6% with FA - BMI >25

25% patients living with obesity

11% of the population

Source: Gearhardt et al 2013, Pursley et al. 2014, Davis et al 2011
Can Food be addictive?

How can food be addictive?

When we need food to survive?
Let’s separate **REAL FOOD** from chemically engineered *food like substances*

The National: The Science of Addictive Food

[https://www.youtube.com/watch?v=4cpdb78pWl4&t=567s](https://www.youtube.com/watch?v=4cpdb78pWl4&t=567s)

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**Trigger Foods: Food or Substance?**

Trigger foods are often factory-made, nutrient-poor, disease-causing foods. They have been chemically engineered to target the pleasure center of the brains.

FA patients will often report an obsession with these “*food-like substances*”. Once they begin eating a trigger food, it is difficult to stop or have a reasonable portion.

Consuming trigger foods often leads to an overeating episode that involves more ultra-processed foods. These foods almost always contain refined sugar, refined flour, and have been heavily processed.
Highly processed foods can be considered addictive substances based on established scientific criteria (I)

There is growing evidence that an addictive-eating phenotype may exist. There is significant debate regarding whether highly processed foods (HPFs; foods with refined carbohydrates and/or added fats) are addictive. The lack of scientifically grounded criteria to evaluate the addictive nature of HPFs has hindered the resolution of this debate.

Source: Gearhardt, A. N., et al. (2022)

Highly processed foods can be considered addictive substances based on established scientific criteria (II)

The most recent scientific debate regarding a substance’s addictive potential centered around tobacco. In 1988, the Surgeon General issued a report identifying tobacco products as addictive based on three primary scientific criteria below.

Scientific advances have now identified the ability of tobacco products to trigger strong urges or craving as another important indicator of addictive potential.

<table>
<thead>
<tr>
<th>Tobacco Products</th>
<th>Highly Processed Foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause Highly Controlled or Compulsive Use</td>
<td>Yes</td>
</tr>
<tr>
<td>Cause Psychoactive (i.e. mood-altering) Effects via their Effect on the Brain</td>
<td>Yes</td>
</tr>
<tr>
<td>Reinforce Behavior</td>
<td>Yes</td>
</tr>
<tr>
<td>Trigger Strong Urges or Craving</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Source: Gearhardt, A. N., et al. (2022)
**Neurobiology of Food Addiction**

**Studies Showing Similarities in Brain Imaging:**

- Neuroimaging studies that compared the brain activity of individuals with food addiction to those with substance addiction found striking similarities in the brain's reward centers, with heightened activation in response to food cues, akin to the responses observed in substance-dependent individuals.
- This suggests that the neural mechanisms involved in food addiction overlap with those of substance addiction, contributing to the addictive nature of certain foods.


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**Role of Dopamine and Reward Pathways**

- Dopamine is a neurotransmitter associated with reward and pleasure. In food addiction, overconsumption of highly palatable foods can lead to dysregulation of the brain's reward system.
- The release of dopamine in response to certain foods can reinforce the addictive behavior, making it difficult for individuals to control their food intake.

Behavioral Patterns in Food Addiction

Loss of Control
- Schulte and colleagues’ research highlights the phenomenon of “loss of control” as a key characteristic of food addiction.
- Individuals with food addiction often find it challenging to stop eating certain foods once they start, even if they had initially planned to eat a smaller portion.
- This loss of control is akin to the inability to control drug or alcohol consumption in substance addiction.

Withdrawal-Like Symptoms
- The study by Schulte et al. reveals that individuals with food addiction may experience withdrawal-like symptoms when attempting to reduce their intake of certain foods.
- These symptoms can include irritability, mood swings, cravings, and physical discomfort.
- Withdrawal symptoms further support the idea that certain foods can have addictive properties, similar to substances like nicotine or opioids.

Continued Consumption Despite Negative Consequences
- Schulte’s research also emphasizes that individuals with food addiction may continue to consume certain foods despite experiencing negative consequences.
- This behavior mirrors the persistence of substance addiction, where individuals continue to use substances despite adverse health, social, or legal consequences.

Psychological Distress and Preoccupation
- The study by Schulte and colleagues suggests that individuals with food addiction may experience psychological distress related to their eating behaviors.
- They may become preoccupied with thoughts of specific foods, leading to obsessive cravings and a constant desire to consume these foods.


Overconsumption of palatable food

Compulsive over-eating/ binging

- Tolerance
- Craving
- Withdrawal difficulties
(decreased liking / increased wanting)

Increased reward sensitivity

Increased impulsivity

Diminished inhibitory control

Source: Food Addiction: Implications for the Diagnosis and Treatment of Overeating [Rachel C. Adams, Jemma Sedgmond, Leah Maizey, Christopher D. Chambers and Natalia S. Lawrence] - MDPI
The Yale Food Addiction Scale (YFAS)

- The Yale Food Addiction Scale (YFAS) is a widely recognized tool developed to assess and quantify behaviors associated with food addiction in individuals.

- It draws inspiration from the diagnostic criteria for substance use disorders and has been instrumental in shedding light on the concept of food addiction as a potential behavioral disorder.

- The YFAS consists of a structured questionnaire that evaluates an individual’s eating habits and behaviors related to specific foods. It assesses key criteria such as:
  - Loss of control over food intake
  - Failed attempts to cut down on certain foods
  - Continued consumption despite adverse consequences

- Individuals are asked to rate the extent to which these criteria apply to their eating habits, allowing for the determination of the severity of food addiction-like behaviors.
What is the mYFAS 2.0?

- Modified Yale Food Addiction Scale 2.0 (mYFAS 2.0)

- The modified Yale Food Addiction Scale 2.0 (mYFAS 2.0) is an abbreviated, 13-item version of the Yale Food Addiction Scale 2.0 (YFAS 2.0).

- The modified versions of the YFAS perform similarly on indicators of reliability and variability and also yield similar rates of food addiction symptoms and ‘diagnostic’ threshold scores as the full versions of the scale and are thus useful brief assessment tools for food addiction.

- The mYFAS 2.0 is psychometrically similar to the full YFAS 2.0 and may be an appropriate alternative to the full YFAS 2.0 for studies with high participant burden (e.g., large epidemiological samples) or as a brief screening tool for food addiction.

Modified Yale Food Addiction Scale Version 2.0

This survey asks about your eating habits in the past year. People sometimes have difficulty controlling how much they eat of certain foods such as:

- Sweets like ice cream, chocolate, doughnuts, cookies, cake, candy
- Starches like white bread, rolls, pasta, and rice
- Salty snacks like chips, pretzels, and crackers
- Fatty foods like steak, bacon, hamburgers, cheeseburgers, pizzas, and French fries
- Sugary drinks like soda pop, lemonade, sports drinks, and energy drinks

When the following questions ask about “CERTAIN FOODS” please think of ANY foods or beverages similar to those listed in the food or beverage groups above or ANY OTHER foods you have had difficulty with in the past year.

IN THE PAST 12 MONTHS:

<table>
<thead>
<tr>
<th>Item</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I ate to the point where I felt physically ill</td>
<td>0-7</td>
</tr>
<tr>
<td>2. I spent a lot of time feeling sluggish or tired from overeating.</td>
<td>0-7</td>
</tr>
<tr>
<td>3. I avoided work, school or social activities because I was afraid I would overeat there.</td>
<td>0-7</td>
</tr>
<tr>
<td>4. If I had emotional problems because I hadn’t eaten certain foods, I would eat those foods to feel better.</td>
<td>0-7</td>
</tr>
<tr>
<td>5. My eating behavior caused me a lot of distress.</td>
<td>0-7</td>
</tr>
<tr>
<td>6. I had significant problems in my life because of food and eating. These may have been problems with my daily routine, work, school, friends, family, or health.</td>
<td>0-7</td>
</tr>
<tr>
<td>7. My overeating got in the way of me taking care of my family or doing household chores.</td>
<td>0-7</td>
</tr>
<tr>
<td>8. I kept eating in the same way even though my eating caused emotional problems.</td>
<td>0-7</td>
</tr>
<tr>
<td>9. Eating the same amount of food did not give me as much enjoyment as it used to.</td>
<td>0-7</td>
</tr>
<tr>
<td>10. I had such strong urges to eat certain foods that I couldn’t think of anything else.</td>
<td>0-7</td>
</tr>
<tr>
<td>11. I tried and failed to eat less or cut back eating certain foods.</td>
<td>0-7</td>
</tr>
<tr>
<td>12. I was so distracted by eating that I could have been hurt (e.g., when driving a car, crossing the street, operating machinery).</td>
<td>0-7</td>
</tr>
<tr>
<td>13. My friends or family were worried about how much I overate.</td>
<td>0-7</td>
</tr>
</tbody>
</table>
Modified Yale Food Addiction Scale Version 2.0

This survey asks about your eating habits in the past year. People sometimes have difficulty controlling how much they eat of certain foods such as:

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- Fatty foods like steak, bacon, hamburgers, cheeseburgers, pizza, and French fries
- Sugary drinks like soda pop, lemonade, sports drinks, and energy drinks

When the following questions ask about “CERTAIN FOODS” please think of ANY foods or beverages similar to those listed in the food or beverage groups above or ANY OTHER foods you have had difficulty within the past year IN THE PAST 12 MONTHS:

QUESTION 1

I ate to the point where I felt physically ill

- Never = 0
- Less than monthly = 1
- Once a month = 2
- 2-3 Times a month = 3
- Once a week = 4
- 2-3 times a week = 5
- 4-6 times a week = 6
- Every day = 7
QUESTION 2

I spent a lot of time feeling sluggish or tired from overeating.

- Never = 0
- Less than monthly = 1
- Once a month = 2
- 2 - 3 Times a month = 3
- Once a week = 4
- 2 - 3 times a week = 5
- 4 – 6 times a week = 6
- Every day = 7

QUESTION 3

I avoided work, school or social activities because I was afraid I would overeat there.

- Never = 0
- Less than monthly = 1
- Once a month = 2
- 2 - 3 Times a month = 3
- Once a week = 4
- 2 - 3 times a week = 5
- 4 – 6 times a week = 6
- Every day = 7
QUESTION 4

If I had emotional problems because I hadn’t eaten certain foods, I would eat those foods to feel better.

- Never = 0
- Less than monthly = 1
- Once a month = 2
- 2 - 3 Times a month = 3
- Once a week = 4
- 2 - 3 times a week = 5
- 4 – 6 times a week = 6
- Every day = 7

QUESTION 5

My eating behavior caused me a lot of distress.

- Never = 0
- Less than monthly = 1
- Once a month = 2
- 2 - 3 Times a month = 3
- Once a week = 4
- 2 - 3 times a week = 5
- 4 – 6 times a week = 6
- Every day = 7
QUESTION 6
I had significant problems in my life because of food and eating. These may have been problems with my daily routine, work, school, friends, family, or health.

- Never = 0
- Less than monthly = 1
- Once a month = 2
- 2 - 3 Times a month = 3
- Once a week = 4
- 2 - 3 times a week = 5
- 4 - 6 times a week = 6
- Every day = 7

QUESTION 7
My overeating got in the way of me taking care of my family or doing household chores.

- Never = 0
- Less than monthly = 1
- Once a month = 2
- 2 - 3 Times a month = 3
- Once a week = 4
- 2 - 3 times a week = 5
- 4 - 6 times a week = 6
- Every day = 7
QUESTION 8
I kept eating in the same way even though my eating caused emotional problems.

- Never = 0
- Less than monthly = 1
- Once a month = 2
- 2 - 3 Times a month = 3
- Once a week = 4
- 2 - 3 times a week = 5
- 4 – 6 times a week = 6
- Every day = 7

QUESTION 9
Eating the same amount of food did not give me as much enjoyment as it used to.

- Never = 0
- Less than monthly = 1
- Once a month = 2
- 2 - 3 Times a month = 3
- Once a week = 4
- 2 - 3 times a week = 5
- 4 – 6 times a week = 6
- Every day = 7
QUESTION 10

I had such strong urges to eat certain foods that I couldn’t think of anything else.

- Never = 0
- Less than monthly = 1
- Once a month = 2
- 2 - 3 Times a month = 3
- Once a week = 4
- 2 - 3 times a week = 5
- 4 - 6 times a week = 6
- Every day = 7

QUESTION 11

I tried and failed to cut down on or stop eating certain foods.

- Never = 0
- Less than monthly = 1
- Once a month = 2
- 2 - 3 Times a month = 3
- Once a week = 4
- 2 - 3 times a week = 5
- 4 - 6 times a week = 6
- Every day = 7
QUESTION 12
I was so distracted by eating that I could have been hurt (e.g., when driving a car, crossing the street, operating machinery).
- Never = 0
- Less than monthly = 1
- Once a month = 2
- 2 - 3 Times a month = 3
- Once a week = 4
- 2 - 3 times a week = 5
- 4 - 6 times a week = 6
- Every day = 7

QUESTION 13
My friends or family were worried about how much I overate.
- Never = 0
- Less than monthly = 1
- Once a month = 2
- 2 - 3 Times a month = 3
- Once a week = 4
- 2 - 3 times a week = 5
- 4 - 6 times a week = 6
- Every day = 7
The modified Yale Food Addiction Scale 2.0 (mYFAS 2.0) is an abbreviated, 13-item version of the Yale Food Addiction Scale 2.0 (YFAS 2.0). The mYFAS 2.0 has one question to assess each of the 11 DSM-5 diagnostic criteria for substance-use disorders, plus 2 questions to assess clinically significant distress and impairment.

The mYFAS 2.0 includes 13 items: one item for each of the eleven “food addiction” symptoms and two items for the assessment of a clinically significant impairment or distress resulting from eating. The item numbers translate as follows:

1. Substance taken in larger amount and for longer period than intended 4 or more = 1
2. Much time/activity to obtain, use, recover 5 or more = 1
3. Important social, occupational, or recreational activities given up or reduced 2 or more = 1
4. Withdrawal Symptoms; substance taken to relieve withdrawal 4 or more = 1
5. Impairment/Distress 5 or more = Clinical Significance
6. Impairment/Distress 5 or more = Clinical Significance
7. Failure to fulfill major role obligation (e.g., work, school, home) 2 or more = 1
8. Use continues despite adverse consequences (emotional/physical problems) 4 or more = 1
9. Tolerance (marked increase in amount; marked decrease in effect 5 or more = 1
10. Craving or a strong desire or urge to use 4 or more = 1
11. Persistent desire or repeated unsuccessful attempts to quit 5 or more = 1
12. Use in physically hazardous situations 2 or more = 1
13. Continued use despite social or interpersonal problems 2 or more = 1

For the Symptom Count Scoring, add up all of the scores for each of the 11 criterion (e.g. Tolerance, Withdrawal, Use Despite Negative Consequence).

- If it meets the threshold, the criterion has been met and is scored as 1.
- If it doesn’t meet the threshold, the symptom criterion has not been met and is scored as 0.
- Do not add clinical significance to this score. This score should range from 0 to 11 (0 symptoms to 11 symptoms.)

For the “diagnosis” scoring option, a participant can meet for mild, moderate or severe food addiction.

Both the symptom count score and the clinical significance criterion are used.

- No Food Addiction = 1 or fewer symptoms
- No Food Addiction = Does not meet criteria for clinical significance
- Mild Food Addiction = 2 or 3 symptoms and clinical significance
- Moderate Food Addiction = 4 or 5 symptoms and clinical significance
- Severe Food Addiction = 6 or more symptoms and clinical significance

Presented by: Sandra Elia, Certified Food Addiction Counselor
## What Do These Categories Mean?

### Mild
- Problems with weight management, cycles of weight gain followed by dieting, weight loss, and weight gain again. Occasionally binge eating on sugar, excess fat, or volume. Early-stage food addiction.

### Moderate
- Frequent binge eating and grazing. Purging or severe reactions may begin. Rationalizing before eating, guilt afterward. Advancing food addiction, emotional eating, stress eating, experiencing more loss of control despite the negative consequences.

### Severe
- Serious consequences from overeating – weight related issues, very underweight or morbid obesity. Type II diabetes, chronic depression and isolation, and eating anyway. Food no longer provides comfort, escape, oblivion, etc. Loss of control, increasing tolerance, regular withdrawal, correlated mood disorders.

## Treatment Strategies
Outpatient Program: Three Pillars of Food Addiction Recovery

Examine the characteristics of patients who self-select to enroll in a publicly funded, medically supervised outpatient FA program at The Wharton Medical Clinics

Data Set

- Wharton Medical Clinic patients enrolled in an 8 to 10 week FA course. Patients filled out comprehensive package which included many surveys prior to initiating the FA program.
- Facilitated by recovering FA, and family medicine MD.
- Funded by OHIP.
- 43 adults were analyzed.
Baseline Characteristics For All Participants (n = 43)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>53.1 ± 14.5</td>
</tr>
<tr>
<td>Sex (men)</td>
<td>10 (23.3)</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>39.7 ± 7.5</td>
</tr>
<tr>
<td>Ethnicity (white)</td>
<td>23 (53.49)</td>
</tr>
<tr>
<td>Type 2 Diabetes (yes)</td>
<td>17 (39.53)</td>
</tr>
<tr>
<td>Hypertension (yes)</td>
<td>17 (39.53)</td>
</tr>
<tr>
<td>Hyperlipidemia (yes)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>FA (yes)α</td>
<td>26 (61.9)</td>
</tr>
<tr>
<td>FA Symptoms (#)α</td>
<td>4.8 ± 1.8</td>
</tr>
</tbody>
</table>

*Sample size 42

Symptoms of FA by FA Status (n = 42)

<table>
<thead>
<tr>
<th>Variable</th>
<th>FA Yes</th>
<th>FA No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substance use (yes)</td>
<td>23 (88.5)</td>
<td>5 (31.3)*</td>
</tr>
<tr>
<td>Tolerance (yes)</td>
<td>18 (69.2)</td>
<td>5 (31.3)*</td>
</tr>
<tr>
<td>Withdrawal (yes)</td>
<td>21 (80.8)</td>
<td>6 (37.5)*</td>
</tr>
<tr>
<td>Persistence (yes)</td>
<td>26 (100.0)</td>
<td>16 (100.0)</td>
</tr>
<tr>
<td>Time spent (yes)</td>
<td>23 (88.5)</td>
<td>5 (31.3)*</td>
</tr>
<tr>
<td>Social (yes)</td>
<td>13 (50.0)</td>
<td>4 (25.0)</td>
</tr>
<tr>
<td>Hazardous (yes)</td>
<td>20 (76.9)</td>
<td>9 (56.3)</td>
</tr>
<tr>
<td>Distress (yes)</td>
<td>26 (100.0)</td>
<td>0 (0.0)*</td>
</tr>
</tbody>
</table>

*Statistically different from FA Yes (P<0.05)
**Symptomology (n = 18)**

- **Food Addiction Designation**
  - Baseline: 80
  - Follow-up: 70
  - Change: -35.4%

- **Food Addiction Symptoms**
  - Baseline: 4.5
  - Follow-up: 3
  - Change: -0.8 Symptoms

- **20 questions**
  - Baseline: 12
  - Follow-up: 8
  - Change: -3.2 Questions

* Statistically Significant Change from Baseline (P<0.05)

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**Weight and QOL**

- **Body Weight**
  - Baseline: 108 kg
  - Follow-up: 104 kg
  - Change: -3.6 kg

- **BMI**
  - Baseline: 3.2 kg/m²
  - Follow-up: 2.8 kg/m²
  - Change: -1.4 kg/m²

- **Quality of Life**
  - Baseline: 50 points
  - Follow-up: 60 points
  - Change: +16.3 points

* Statistically Significant Change from Baseline (P<0.05)
Can Food be Addictive?

Strengths and limitations

• Novel, publicly funded and medically supervised program for FA
• Recruitment from a weight and diabetes management clinic may limit generalizability to FA population
• However, significant differences in patient populations between FA program and WMC patients were apparent (e.g. proportion of sex, ethnicity, and comorbidities)

Conclusion

• Certain symptoms of addiction may be more prevalent in patients with FA compared to those who do not meet the diagnosis for FA, specifically substance abuse, time spent, tolerance and withdrawal with substance cessation.
• Despite the absence of clinically significant distress in relation to food use, over a third of patients attending a medically supervised FA program identified as having FA.
• This may suggest that even in the absence of a FA diagnosis, patients may still want to attend FA treatment.

Presented by: Sandra Elia, Certified Food Addiction Counselor
Can Food be Addictive? 10/08/23

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Three Pillars of Food Addiction Recovery

Take home pearls

Food Addiction remains a controversial disorder that is not yet officially recognized. One argument seems to be that foods can have not only pleasure value but also nutritive value.

- It is estimated that 11% of the population is living with Food Addiction.

When considering Food Addiction, it is important to examine the patient’s trigger foods and determine whether the food is more *substance* then nutritive.

- HCPs need to listen to your patients even though science hasn’t caught up, if someone feels that they “use” food in a similar way that someone living with alcoholism using alcohol *offer treatment*.

- Treat the whole person
Can Food be Addictive?

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