Nutrition & Mental Health

Food and the Aging Brain: Updates on Nutrition and Cognitive Health in Older Adults
November 18th, 2020

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Roadmap

1) Stress/Mood Nutrition Nexus

2) Interventions: Can we reverse these effects?
Background: Metabolic health & Brain Health

**THE LANCET Neurology**

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**Series**

Brain insulin resistance in Alzheimer's disease and related disorders: mechanisms and therapeutic approaches

Derek Kellar BS ², Suzanne Craft PhD ³, ⁴

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**Association of anthropometry and weight change with risk of dementia and its major subtypes: A meta-analysis consisting 2.8 million adults with 57 294 cases of dementia**

Crystal ManYing Lee, Mark Woodward, G. David Batty, Alexa S. Beiser, Steven Bell, Claudine Berr, Espen Bjertness, John Chalmers, Robert Clarke, Jean-Francois Dartigues ... See all authors

First published: 03 January 2020 | [https://doi.org/10.1111/obr.12989](https://doi.org/10.1111/obr.12989)

**Xiao-Ying-Li et al, 2019, Midlife Modifiable Risk Factors for Dementia: A Systematic Review and Meta-analysis of 34 Prospective Cohort Studies**
How does stress impact diet?

“Self Regulation 101”

"I'm on a low-carb diet. Whenever I feel low, I eat carbs!"
“Recession-proof: Alcohol, cigarette, chocolate sales thrive in hard times” Associated Press, 8/13/08
Stress Eating

--1 in 4 use food to cope with stress (APA, 2007)
--48% increased eating during lock-down (Buckland et al, 2020; Appetite)
How does stress impact diet?

Cross-sectional studies

N = 3,471, Khaled et al, 2020, Perceived Stress & Diet Quality in mid-life women
Stress, diet, and visceral fat

- Stress induces drive for comfort food
- Comfort food feeds off stress

\[ \text{Sugar + Stress} = \text{Visceral fat} \]

Kuo et al, 2007, Nature Medicine
How does stress affect weight gain?

• Job stress predicted weight gain over 20 years (OR 1.30) (Klinebergt et al, 202, n = 3,872 Swedish adults)

• Caregivers gained abdominal fat over time (Radin et al, 2019)
How does nutrition impact mood?

• 15 population based studies on whole foods (vs processed)
• 8 trials on B complex
• Micronutrients
Diet and depression: exploring the biological mechanisms of action

Fig. 2 Proposed interplay between dietary quality and implicated mechanisms in alleviating depression. This figure represents the pathways in this review. The black arrows represent increased consumption of individual components of a healthy dietary pattern.
How does nutrition impact depression?

- \( N = 67 \) with MDD
- Remission in 8% vs. 32%

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*Fig. 2* MADRS scores for dietary support and social support control groups at baseline and endpoint. Effect size: Cohen’s \( d = -1.16 \) (95% CI -1.73 - 0.59). Baseline data \( n = 67 \); 12 week data \( n = 56 \)

The rainbow
Part 2: Interventions
Mindful Eating for weight loss

• Both groups lost weight

• **Weight**: Mindfulness group showed maintenance effects:
  • Marginally better weight loss maintenance.
    (Those who maintained weight loss had telomere lengthening (Mason et al, 2018).
  • Reduced hedonic drive explained 47% of weight loss (Mason et al, 2016)

• Significantly decreased glucose & lipids (12, 18 months) (Daubenmier et al, 2016)
  • Significantly decreased sugar intake with mindfulness (Mason et al, 2016)

• Significantly improved autonomic stress responses (Daubenmier et al, 2016)
Mechanisms:

Mindfulness vs. Control

\[ \beta = -2.67, p = .02^* \]  
(95% CI: -4.92, -0.41)

\[ \beta = -0.16, p = .17 \]  
(95% CI: -0.40, 0.07)

\[ \beta = -0.58, p = .04^* \]  
(95% CI: -1.73, -0.04)

\[ \beta = -0.22, p = .04^* \]  
(95% CI: 0.01, 0.43)

Binge Eating

12mo

Stress Eating

12mo

Fasting Glucose

18mo

\[ \beta = 2.50, p = .02^* \]  
(95% CI: 0.45, 4.54)

\[ \beta = -3.62, p = .01^* \]  
\[ \beta_{\text{total}} = -4.21, p = .003^{**} \]

Radin, Epel et al, 2020, Health Psychology
Mindful Moms Training

8 weekly 2-hour classes, 2 phone booster sessions, and 1 postpartum group session

- Acceptance based emotion regulation
  - Reduce stress using mindfulness
  - Increase self-awareness and acceptance
  - Recognize body’s signals for hunger and fullness

- 8-10 women (12-20 wks gestation)/ per group

Vieten et al. (2018) BMC Pregnancy and Childbirth
Effects of mindful eating during pregnancy:

- Pregnancy is a critical period to intervene for high stress low income women.
- High stress during pregnancy was associated with risk for infants:
  - Infant illness (Roubinov et al, 2020)
  - Greater autonomic reactivity of infant (under review)
  - Greater odds of Rapid Infant Growth (Felder, 2020)
- A mindful eating class during pregnancy reduced maternal stress and depression, improved glucose tolerance, and better ANS reactivity profiles in offspring (Epel et al, 2018; Bush et al, under review).
Healthy Beverage Initiative

Learn how organizations are eliminating the sale of sugar sweetened beverages

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Association of a Workplace Sales Ban on Sugar-Sweetened Beverages With Employee Consumption of Sugar-Sweetened Beverages and Health

Elissa S. Epel, PhD1,2; Alison Hartman, BA2; Laurie M. Jacobs, PhD3; et al.

More

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Key Points

**Question**  Was a workplace sales ban on sugar-sweetened beverages (SSBs) associated with a reduction in employee intake of sugar-sweetened beverages and improvement in their cardiometabolic health?

**Findings**  In this before-after study and trial that included 214 adults who regularly drank SSBs, participants reported consuming less SSBs after a workplace sales ban and a reduction in waist circumference and sagittal diameter but no change in body mass index or insulin sensitivity. Those randomized to receive a brief motivational intervention had greater improvements.

**Meaning**  A workplace sugar-sweetened beverage sales ban, especially if combined with a brief intervention, may be a feasible and effective way to improve employee health.
"saves about $300,000 per 10,000 people over ten years"
Roadmap

1) Stress/Mood Nutrition Nexus
   Strong observational data, some trials with depression
2) Interventions: Co-targeting has health benefits
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