Risk Factors Associated with Cognitive Aging

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IOM Committee on the
Public Health Dimensions of Cognitive Aging
Lifestyle and Physical Environment
Risk & Protective Factors

- Physical activity and exercise
- Education and intellectual engagement
- Social isolation, loneliness, and social engagement
- Diet
- Vitamins
- Alcohol
- Smoking
- Substance abuse
- Physical environment—air pollution and occupational exposures
- Stress
Challenges in Studying Risk and Protective Factors

• Measures of cognitive change & study outcomes – global and domain specific measures abound

• Confounding--influences of low education, illiteracy, race/ethnicity, medical conditions

• Highly variable approaches in different studies, many cross-sectional, practice-effects in longitudinal studies

• Age range—often limited

• Lack of RCTs—many variants on interventions, often shortterm, focus rarely on cognitive aging in absence of disease
RCTs have limitations too…

- **Interventional studies** assign participants to one or more active treatments or control group
- Limited by measures collected, study outcomes, learning effects, sustainability in real world setting
- Unknown whether improvements on specific outcomes transfer to other cognitive tasks
Physical activity and exercise: Observational data

• 2014 meta analysis of 21 studies physically active adults were at 35% lower risk of cognitive decline (RR=0.65; 95% CI, 0.55-0.76)
The association between high physical activity and cognitive decline.
Physical activity and exercise: Intervention data

Meta-analyses have found modest effect sizes that were moderated by:

- **Cognitive processes being assessed:** larger benefits for executive control processes
- **Gender:** women more than men
- **Exercise type:** combined aerobic and strength programs better than aerobic
- **Age:** > 65 years showed larger benefits
- **Duration:** exercise sessions longer than 30 minutes showed larger benefit
Physical activity and exercise: Intervention data

Effects using neuroimaging:

- Increases in aerobic fitness and non-aerobic physical activity were associated with increased volume in frontal and hippocampal areas.

- Improvements in aerobic fitness were predictive of increased performance of executive function and processing speed tasks on fMRI.
Physical activity and exercise: Interventional data: The LIFE trial

- Structured, moderate-intensity physical activity program (n = 818) walking, resistance training, and flexibility exercises versus educational workshops and UE stretching (n = 817)
- No differences for any cognitive or composite measures were observed
- Participants in the physical activity group 80+ years and those with poorer baseline physical performance had better changes in executive function composite scores
Physical activity and exercise: Unanswered questions

• Are there different cognitive benefits for different modes of exercise?

• What exercise parameters (e.g. intensity, duration, interaction with other lifestyle factors) optimize benefits for cognition and brain health?

• How to get people to begin and maintain exercise programs (< 25 percent of US adults meet the recommended weekly activity objectives)?
Diet: Observational data

• 2013 review of 11 observational studies and 1 intervention study found in 9 of 12 studies some evidence suggesting that greater adherence to Mediterranean diet was associated with better cognitive function, slower cognitive decline

• 2010 review of 5 observational studies concluded that cognitive decline might be reduced by n-3 fatty acid intake but the quality of the evidence was rated low
Diet: Interventional data

Two secondary analyses of diet intervention trials for CVD outcomes:

• DASH diet combined with a behavioral weight management had greater improvements in executive function-memory-learning and psychomotor speed and DASH diet alone participants exhibited better psychomotor speed compared to the usual diet control

• Mediterranean diets had higher MMSE and Clock Drawing Test scores at 6.5 years compared to a low-fat control diet
Vitamins: Observational data

- No strong evidence that dietary intakes of antioxidants preserve cognition
- Higher homocysteine levels associated with poor cognitive outcomes
- Low serum Vitamin D levels associated with lower global cognition and more rapid functional decline
Vitamins: Intervention data

Supplement trials show:

• No evidence of benefit for - folate, B12, calcium/Vitamin D, or Vitamin E

• Some evidence that supplementation of people with deficient dietary intake maybe more beneficial (folate, Vitamin E)
Other lifestyle factors: Observational data

- **Alcohol**: 8 of 18 prospective studies found a J- or U-shaped association between moderate alcohol consumption and cognitive outcomes

- **Smoking**: 16 of 29 prospective studies observed associations between smoking and poorer cognitive outcomes
Important Risk and Protective Factors in need of more and better research:

- Stress (daily life, major life events, perceived stress)
- Social Isolation and loneliness
- Social engagement
- Intellectual engagement
- Early life factors, especially education and literacy
The top 3 actions you can take to help protect your cognitive health as you age

1. Be physically active. Staying physically active can promote cognitive health in middle-aged and older adults.

2. Reduce your cardiovascular risk factors (including hypertension, diabetes, and smoking). Maintaining cardiovascular health supports cognitive health.

3. Manage your medications. A number of medications can have a negative effect on cognitive function when used alone or in combination with other medications. The effects can be temporary or long-term. It’s important to review all of your medications with a health care professional and learn about their effects on cognitive health.
Thank You!

Free PDF of the report

Additional materials
  4-page report brief
  Action guides
  Quiz

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