

Diet for the mind: what to eat to prevent Alzheimer's and cognitive decline

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Outline

- **Dementia challenge**
- **Observational evidence linking diet and cognition**
- **Trial evidence: FINGER**
- **Future**



FINGER

The global impact of dementia

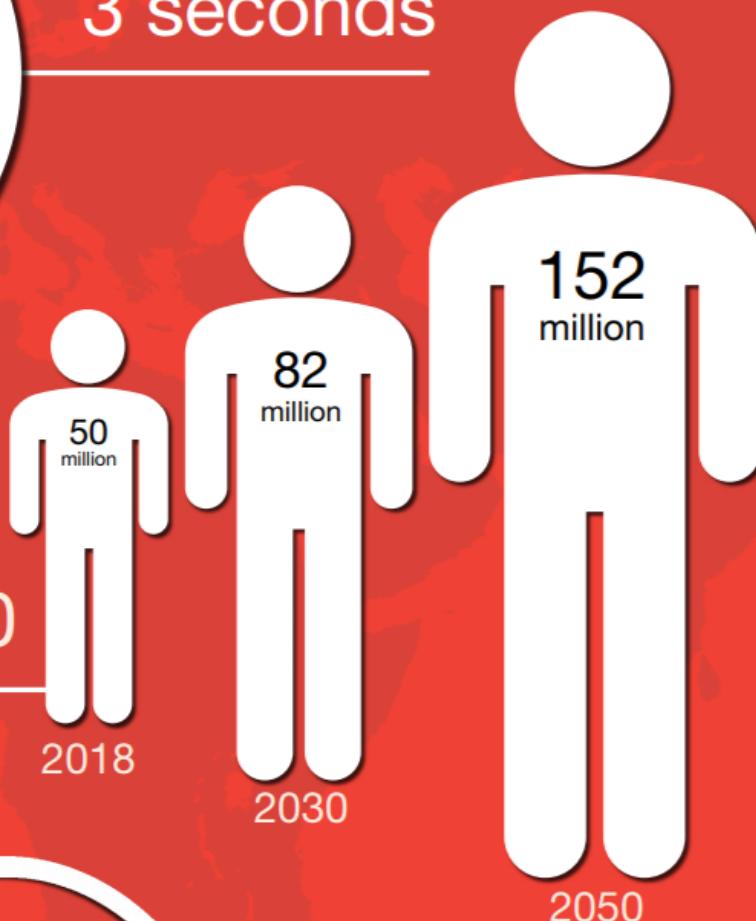


Around the world,
there will be one new case
of dementia
**every
3 seconds**

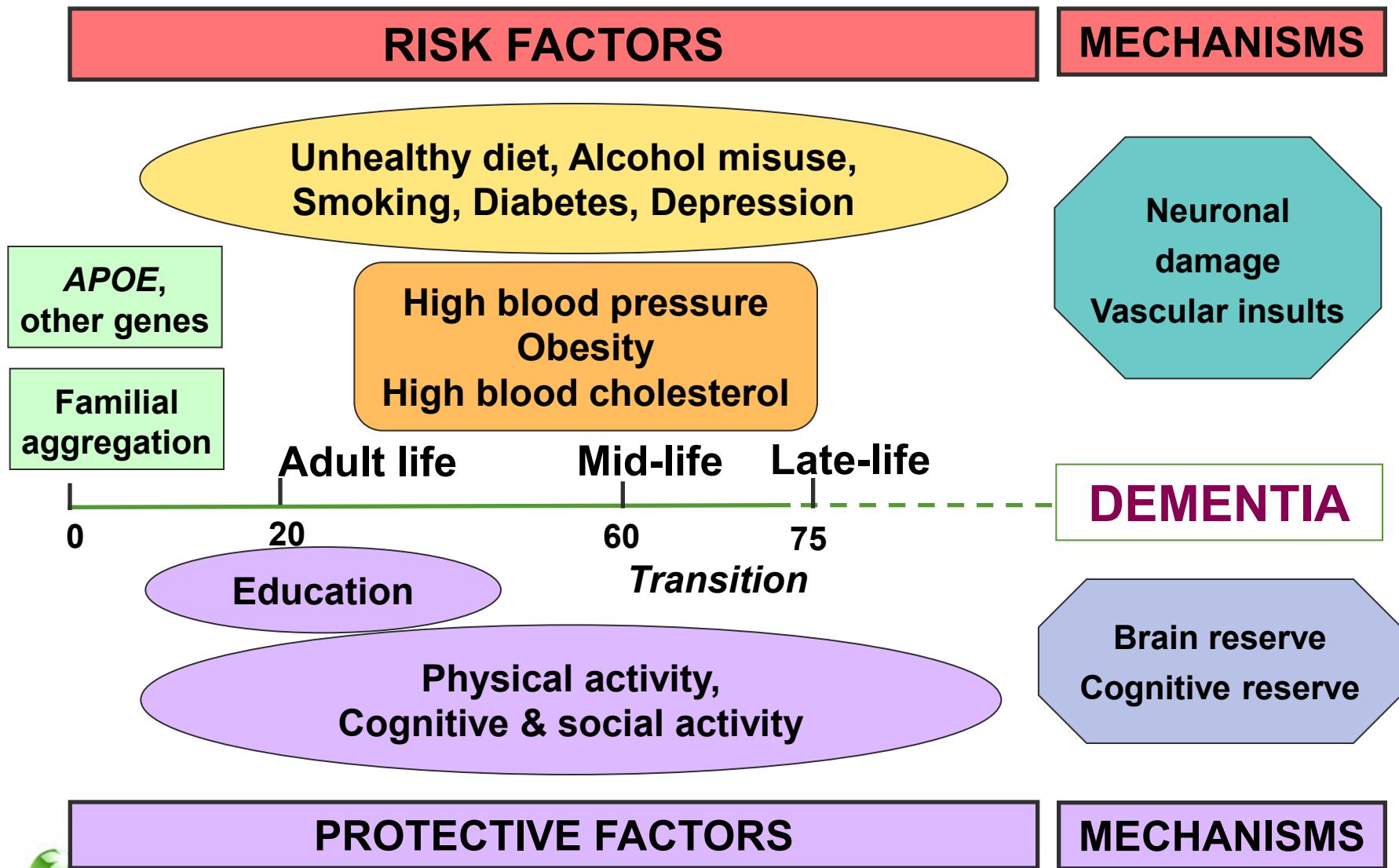
50 million people worldwide are
living with dementia in 2018.

This number will more than

**triple to 152
million by 2050**

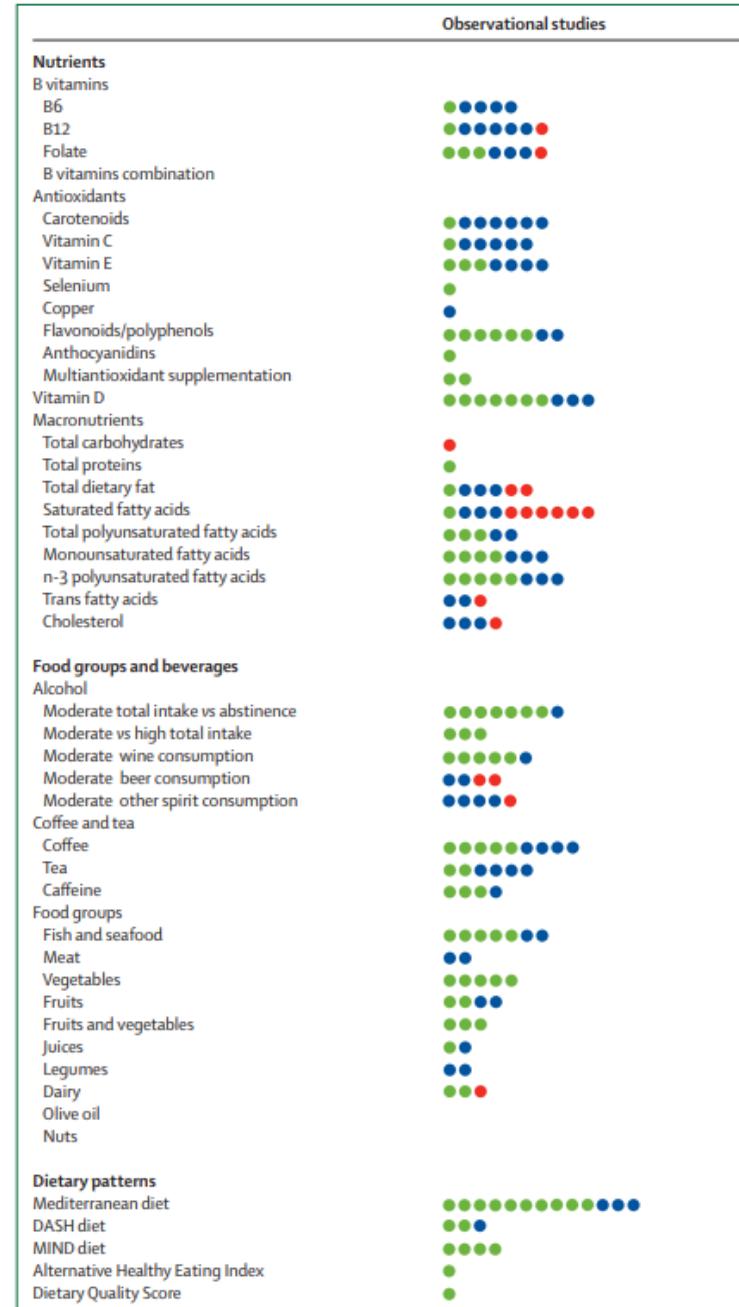


Dementia and Alzheimer disease: life-long exposure to multiple factors



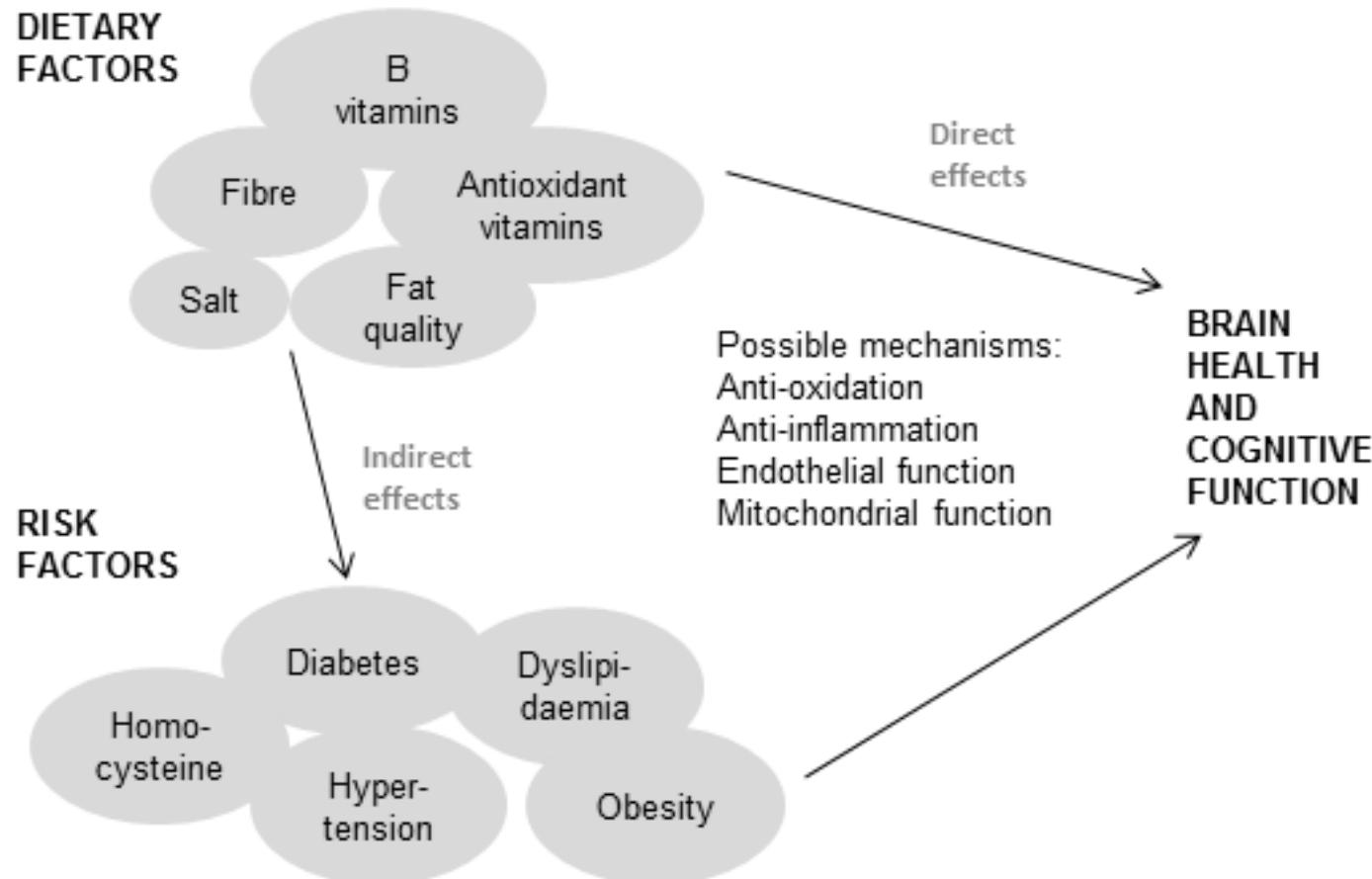
Dietary factors & cognitive decline/ dementia: observational evidence

- Nutrients
 - B vitamins: folate
 - Antioxidants: vitamin E
 - Vitamin D
 - Macronutrients: unsaturated fats
- Foods
 - Fish and seafood
 - Vegetables and fruits
 - Alcohol? Coffee?
- Dietary patterns
 - **Mediterranean**
 - DASH
 - MIND



Review: Scarmeas N et al., Lancet Neurol 2018

Diet & cognition: pathways



Jenni Lehtisalo, 2018, thesis: <https://helda.helsinki.fi/handle/10138/255275>

RCTs to prevent cognitive impairment and dementia / AD

Pharmacological

- *Anti-hypertensives*
- Statins
- Hormone replacement therapy
- NSAIDs



Dietary

- *Nutraceuticals*
- *Vitamin B*
- *Folate*
- *Vitamin E*
- *Antioxidants*
- *Vitamin D*
- *N-3 PUFA*
- *Ginkgo Biloba*



Lifestyle

- *Physical Activity*
- *Cognitive Training*
- *Mediterranean diet (+olive oil/nuts)*



Multidomain

- *MAPT*
- *Pre-DIVA*
- **FINGER**



A 2 year multidomain intervention of diet, exercise, cognitive training, and vascular risk monitoring versus control to prevent cognitive decline in at-risk elderly people (FINGER): a randomised controlled trial

Lancet 2015; 385: 2255-63

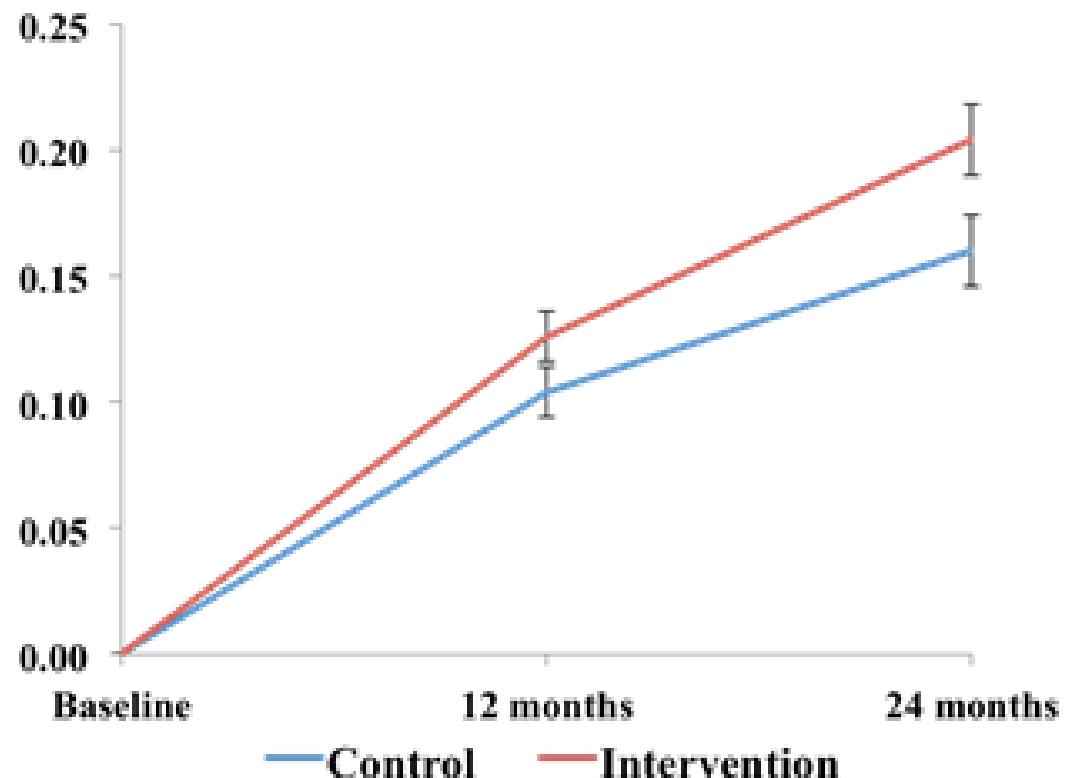
Tiia Ngandu, Jenni Lehtisalo, Alina Solomon, Esko Levälahti, Satu Ahtiluoto, Riitta Antikainen, Lars Bäckman, Tuomo Hänninen, Antti Jula, Tiina Laatikainen, Jaana Lindström, Francesca Mangialasche, Teemu Paajanen, Satu Pajala, Markku Peltonen, Rainer Rauramaa, Anna Stigsdotter-Neely, Timo Strandberg, Jaakko Tuomilehto, Hilkka Soininen, Miia Kivipelto

INTENSIVE INTERVENTION
Nutrition
Exercise
Cognitive training
Vascular risk monitoring

Vs.

REGULAR HEALTH ADVICE

N=1260
60-77 years



Broad benefits after 2 year intensive lifestyle intervention

Sub-group analyses:

Effects on cognition are similar regardless of:

- Age, sex, education
- Vascular risk factors
- Genetic risk (ApoE4)

Rosenberg et al., Alzheimer Dement 2017;
Solomon et al., Jama Neurology 2018

Secondary outcomes:

Intervention is beneficial for:

- Health-related quality of life
- Mobility and ADL functions
- Reduced risk of new chronic diseases

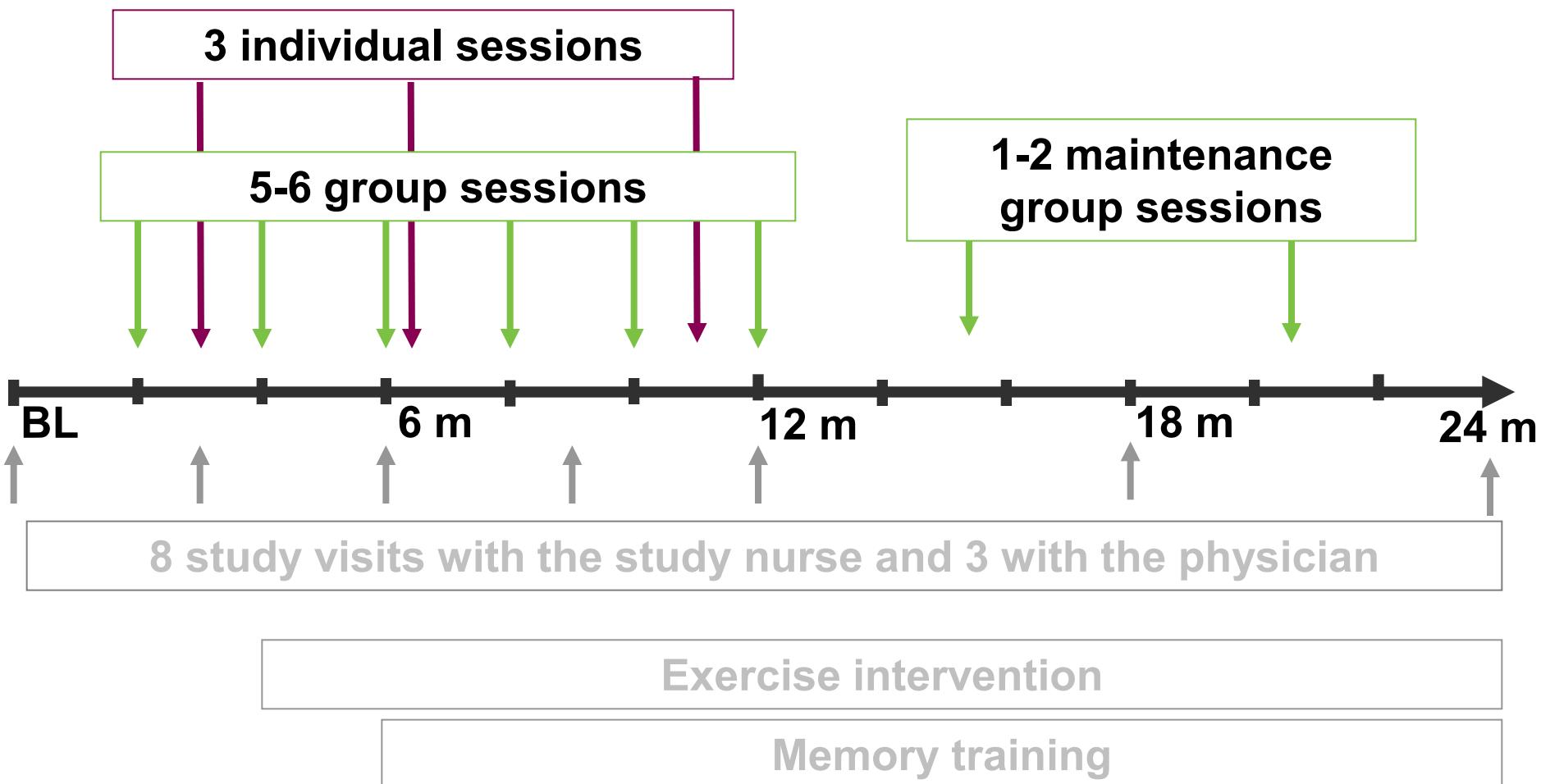
Strandberg et al., Eur Ger Med 2016;

Marengoni et al., JAMDA 2018

Kulmala et al., manuscript

Dietary intervention timetable

FINGER

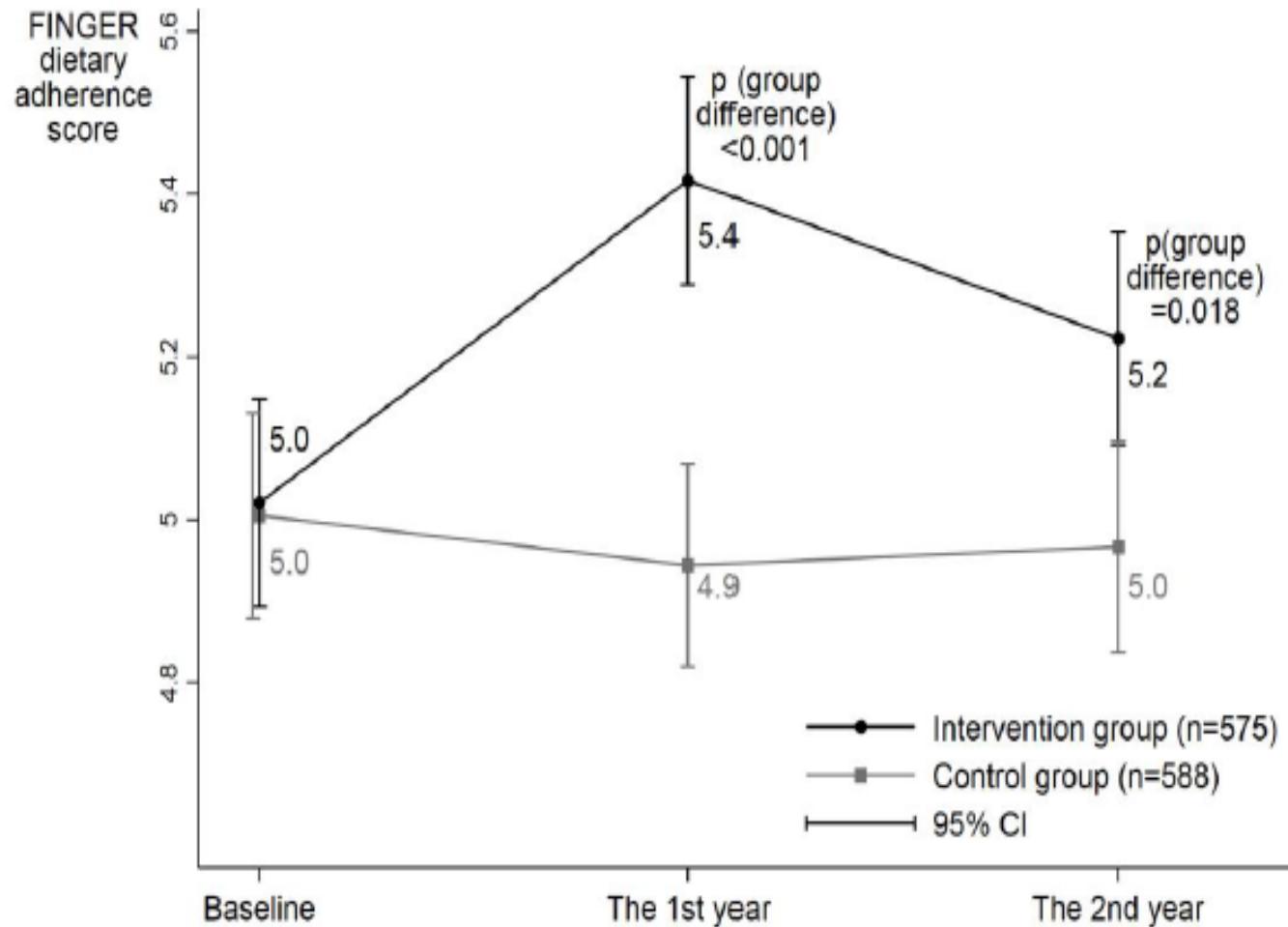


Goals of the dietary intervention (based on Nordic Dietary recommendations)

FINGER

- 10–20 E% Protein
- 25–35 E% Fat
 - **Max. 10 E% SAFA (+trans)**
 - **10–20 E% MUFA**
 - **5–10E% PUFA**
- 45–55 E% Carbohydrates
 - Max. 10 E% sugar
 - 25–35 g/day dietary fiber
- Max. 5 E% from alcohol
- Max. 5 g/day salt
- High consumption of **fruit and vegetables**
- **Whole grain** in all cereal products
- Low-fat options in milk and meat products
- Sucrose intake 50 g/day
- Vegetable margarine and **vegetable oils** instead of butter
- **Fish** at least two portions per week.

Dietary intervention adherence in the FINGER

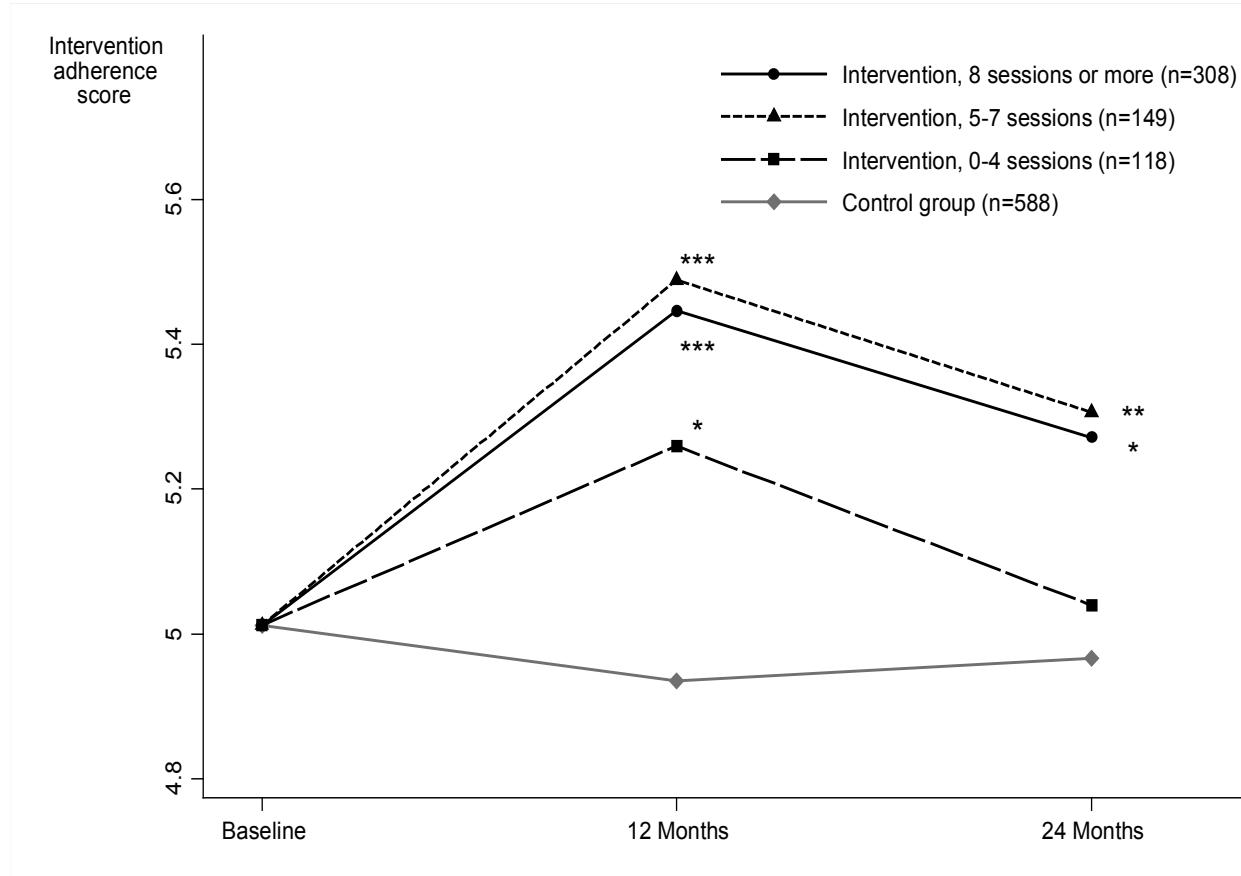


Score is based on number of goals achieved:

- Protein >10 E%
- SAFA+trans <10 E%
- PUFA >5 E%
- Sucrose <10 E%
- Fiber 25–35 g/vrk
- Alcohol <5% E%
- Fruits >200 g/d
- Vegetables >200 g/d
- Fish consumption (at all during 3 days)

1 point each, max 9 points.

Diet intervention adherence score in relation to intervention participation



Score is based on number of goals achieved:

- Protein >10 E%
- SAFA+trans <10 E%
- PUFA >5 E%
- Sucrose <10 E%
- Fiber 25–35 g/vrk
- Alcohol <5% E%.
- Fruits >200 g/d
- Vegetables >200 g/d
- Fish consumption (at all during 3 days)

1 point each, max 9 points.

(Lehtisalo et al., Br J Nutrition 2017)

Diet score and global cognition (NTB) in 2 years

NTB total composite score			
	path coefficient	(SE)	p
Baseline diet -> Baseline cognition			
Intervention¹	0.005	(-0.018)	0.780
Control¹	0.011	(-0.018)	0.530
Combined²	0.011	(-0.018)	0.561
Baseline diet -> 2 year cognitive change			
Intervention¹	0.046	(-0.019)	0.014
Control¹	0.051	(-0.019)	0.007
Combined²	0.046	(-0.016)	0.003
Dietary change -> 2 year cognitive change			
Intervention¹	0.125	(-0.094)	0.186
Control¹	-0.043	(-0.113)	0.707
Combined²	0.052	(-0.102)	0.608

Diet score and executive function in 2 years

NTB executive domain			
	path coefficient	(SE)	p
Baseline diet -> Baseline cognition			
Intervention¹	0.003	(-0.022)	0.883
Control¹	0.008	(-0.022)	0.705
Combined²	0.003	(-0.022)	0.900
Baseline diet -> 2 year cognitive change			
Intervention¹	0.013	(-0.031)	0.684
Control¹	0.041	(-0.024)	0.082
Combined²	0.028	(-0.023)	0.223
Dietary change -> 2 year cognitive change			
Intervention¹	0.390	(-0.147)	0.008
Control¹	0.200	(-0.127)	0.115
Combined²	0.278	(-0.142)	0.051

24-month intervention with a specific multinutrient in people with prodromal Alzheimer's disease (LipiDiDiet): a randomised, double-blind, controlled trial



Hilkka Soininen, Alina Solomon, Pieter Jelle Visser, Suzanne B Hendrix, Kaj Blennow, Miia Kivipelto, Tobias Hartmann, on behalf of the LipiDiDiet clinical study group*



Lancet Neurol 2017

Interpretation The intervention had no significant effect on the NTB primary endpoint over 2 years in prodromal Alzheimer's disease. However, cognitive decline in this population was much lower than expected, rendering the primary endpoint inadequately powered. Group differences on secondary endpoints of disease progression measuring cognition and function and hippocampal atrophy were observed. Further study of nutritional approaches with larger sample sizes, longer duration, or a primary endpoint more sensitive in this pre-dementia population, is needed.

Fortasyn Connect →
(Souvenaid)

Specific multi-nutrient combination, targeting
neuronal membranes for neuroprotection in AD

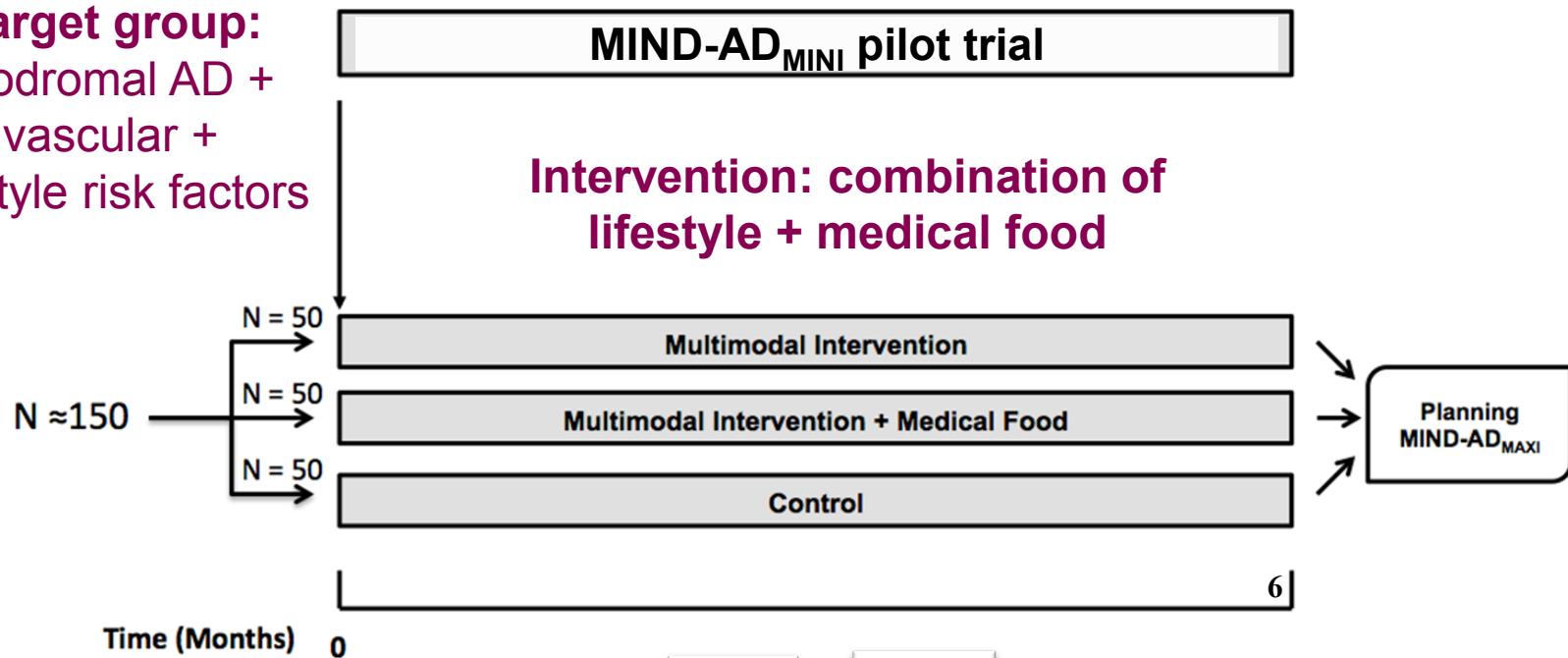
N=311
2 years

Significant results on secondary outcomes:

- CDR-SB (cognition and function)
- Brain volumes (hippocampus, ventricular volume)

Multimodal preventive trials for Alzheimer's Disease: towards multinational strategies

Target group:
prodromal AD +
vascular +
lifestyle risk factors





Take home points: diet for the mind

1. Healthy diet is beneficial for brain health
2. Dementia prevention should start early, but it is possible to achieve benefits from lifestyle changes also in old age
3. Multifactorial condition – multifactorial interventions needed
4. One size does not fit all – tailoring interventions according to health status

**What is good for the heart
is good for the brain!**



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