Dementia and nutrition
Nonpharmacological therapies have had promising effects on health-related quality-of-life (HRQoL) among people with Alzheimer's disease.

Possibilities of nutrition interventions in this patient group has received less attention.
Why is nutrition important?

• Studies of AD patients:
  • Unintentional weight loss
  • Poor nutrient intake
  • Poor nutritional status

  • Infections ↑
  • Sarcopenia ↑
  • Functionality ↓
  • Quality-of-life ↓

Good nutrition essential in maintaining health
Nutrient intake in dementia wards

<table>
<thead>
<tr>
<th>The mean intake of residents/day</th>
<th>Dementia wards (I)</th>
<th>Dementia wards (V), before education</th>
<th>Recommendation*</th>
<th>Age 75+, female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy (kcal)</td>
<td>1 205 kcal (5.4 MJ)</td>
<td>1 230 kcal (5.5 MJ)</td>
<td>1 570–1 850 kcal (6.5–7.7 MJ)</td>
<td></td>
</tr>
<tr>
<td>Protein (g)</td>
<td>58.6</td>
<td>50.4</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Calcium (mg)</td>
<td>1 004</td>
<td>896</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td>Folic acid (µg)</td>
<td>163</td>
<td>177</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Vitamin C (mg)</td>
<td>59.1</td>
<td>92.9</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Vitamin D (µg)</td>
<td>1.7</td>
<td>2.5</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Vitamin E (mg)</td>
<td>4.4</td>
<td>4.4</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>


Tailored nutrition guidance among aged persons with AD living at home with their spouses: RCT-trial (NuAd)

• Aim was to examine the effect of tailored nutrition guidance on nutrition and health-related quality-of-life (HRQoL) of older persons with Alzheimer disease (AD) living at home

• A total of 99 persons with confirmed AD (aged ≥65 years) living at home with their spousal caregivers were randomised to a controlled clinical trial

• Years 2009-2012
Measurements

• Nutrition:
  o Mini Nutritional Assessment –test (MNA)
  o 3-day food diary

• Health-related quality of life:
  o 15D
Flow chart

BASELINE ASSESSMENTS
99 couples
Food diaries

Randomization

INTERVENTION
49 couples

TAILORED NUTRITIONAL GUIDANCE

CONTROLS
50 couples

WEIGHT ASSESSMENT

FINAL ASSESSMENTS
78 couples
Food diaries

6 months

12 months
TAILORED NUTRITIONAL GUIDANCE

• THE MAIN ELEMENTS
  o Weight, weight loss
  o Sufficient energy, protein and other nutrient intake
  o Vitamin D supplementation 20 µg daily
  o Need for other supplements
  o Exercise
TAILORED NUTRITIONAL GUIDANCE

• WAYS TO IMPLEMENT:
  ○ Home visits (4-8/year)
  ○ Brochures
  ○ Group meetings
  ○ Oral nutritional supplements (ONS)
  ○ Nutritional care plan (NCP)
NUTRITIONAL CARE PLAN

• Positive feedback
  o Diet, exercise, housekeeping/cooking

• Information
  o Nutrition, exercise

• Practical suggestions
### Baseline results

**AD patients**

<table>
<thead>
<tr>
<th></th>
<th>Intervention group N=50</th>
<th>Control group N=49</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age, SD</td>
<td>78.0 (5.5)</td>
<td>76.7 (5.6)</td>
</tr>
<tr>
<td>Men, %</td>
<td>72</td>
<td>65</td>
</tr>
<tr>
<td>Mean MMSE</td>
<td>18.8 (6.4)</td>
<td>20.2 (4.7)</td>
</tr>
<tr>
<td>MNA, %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malnourished</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Risk for malnutrition</td>
<td>46</td>
<td>41</td>
</tr>
<tr>
<td>Good nutrition status</td>
<td>54</td>
<td>59</td>
</tr>
<tr>
<td>Mean BMI, SD</td>
<td>26.4 (3.6)</td>
<td>26.3 (4.1)</td>
</tr>
<tr>
<td>HRQoL</td>
<td>27.6 (6.3)</td>
<td>27.1 (8.0)</td>
</tr>
</tbody>
</table>

SD=standard deviation
MNA=Mini Nutritional Assessment
BMI=body mass index
HRQoL=Health-related quality of life

Differences between groups not significant
Baseline results

The proportion (%) of those who reached the recommended level of some nutrients

- **Protein < 1g/body kg**
- **Calcium < 800 mg**
- **Vitamin C < 75 mg**
- **Vitamin E < 8/10 µg**
- **Folate < 300 µg**

Helsinki 21.2.2014
Effectiveness of intervention

• NUTRITION
  • Protein and calcium intake ↑
  • The same trend with other nutrients
Effectiveness of intervention

- HRQoL

15D measurements with all dimensions

- Mobility $p=0.35$
- Vision $p=0.72$
- Hearing $p=0.42$
- Breathing $p=0.048$
- Sleeping $p=0.26$
- Eating $p=0.24$
- Speech $p=0.49$
- Excretion $p=0.27$
- Usual activities $p=0.046$
- Mental function $p=0.006$
- Discomfort and symptoms $p=0.41$
- Depression $p=0.045$
- Distress $p=0.18$
- Vitality $p=0.47$
- Sexual activity $p=0.63$
- 15D-score $p=0.007$

Helsinki 21.2.2014
Caregiver burden

- Caregiver’s burden predicts increasing problems in dining in one year follow-up (Riviere et al. 2002)
- Male as a caregiver experiences less stress than female (Baker 2010) but more challenges in cooking and household (Ribeiro ym. 2007, Russell 2007, Atta-Konadu ym. 2011)
- There is a gender difference in ability to cope with caregiver responsibilities related to nutrition (Puranen et al, in press)

Figure 1. Protein and vitamin C intakes in the families with a male and a female caregiver. NuAd
Conclusions

Tailored nutritional guidance benefits the nutrition and quality of life of home-dwelling AD persons and it should be part of usual care.
Nutritional intervention via videoconferencing for older adults receiving home care - a pilot study
IITA-service

- Part of gerontechnology project seeking to create a telerehabilitation model in the city of Helsinki, Finland.
Purpose

• Purpose was to support participants during their discharge process from rehabilitation and to support their functional capacity and coping ability at home
Intervention

• After an initial assessment determining their needs, participants received tailored nutritional advice via videoconferencing

• six-month follow-up period.

• Exercise with a physiotherapist five times a week

• Group discussions
Measurements

- **Assessment of nutrition**
  - Participants nutritional status was assessed with a Mini Nutritional Assessment –test (MNA).
  - Nutrient intake was calculated based on a detailed three-day food diary compiled twice during the six-month follow-up period.

- **Nutrition guidance**
  - Individually
**Nutrition care plan**

- Based on assessments and discussions

**RAVITSEMUSHOIDON SUUNNITELMA**
Perustuu ruokapäiväkirjan tietoihin ja keskusteluumme 25.1.2013

Ruokavaliosi on monipuolinen, säännöllinen ja hyvä. On myös hyvä, että pidät kaurapuurosta, marjoista, kasviksista ja kalasta. Kuitenkin energian, proteiinin ja vitamiinien saantiin on syytä kiinnittää huomiota, sillä ne jäivät niukoiksi ruokapäiväkirjan seurantapäivien aikana. Tarvitset erityisesti **energiaa, proteiinia ja D-vitamiinia** lihasten ja luuston hyvinvointiin sekä yleiseen vastustuskykyyn ja jaksamiseen.

- **Energiän määrä:**
Seurantapäivien aikana energiansaantisi oli hieman alle suositusten. Mikäli ikääntyneenä lahtuu, niin lähinnä lihaskudos vähenee (= lihakset heikkenevät). Jatka siis herkuttelua hyvän makuisella ja monipuolisella ruoalla, voit jopa lisätä sitä!

- **Proteiinin saanti:**
Sait seurantapäivien aikana keskimäärin 50 g proteiinia päivässä, kun ikäisellesi ja kokoisellesi ihmiselle suositellaan vähintään 80 grammaa proteiinia päivässä. Hyvä proteiinin lähteitä ovat liha, kala, kana ja kaikki maitotuotteet, mutta erityisesti rahka ja raejuusto. Voisit laittaa voileipien päälle runsaasti leikkeleitä, juustoa tai kanamunaa.
## Background information

<table>
<thead>
<tr>
<th></th>
<th>Mean (range) N=42</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>81 (65-93)</td>
</tr>
<tr>
<td><strong>Diagnosis</strong></td>
<td>4 (0-8)</td>
</tr>
<tr>
<td><strong>Medication</strong></td>
<td>11 (4-20)</td>
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<tr>
<td><strong>Home care, %</strong></td>
<td>93</td>
</tr>
<tr>
<td><strong>Lives alone, %</strong></td>
<td>80</td>
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<tr>
<td><strong>Goes outside, %</strong></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>33</td>
</tr>
<tr>
<td>With help</td>
<td>64</td>
</tr>
<tr>
<td>no</td>
<td>3</td>
</tr>
<tr>
<td>MNA, %</td>
<td></td>
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<tr>
<td>----------</td>
<td>--------</td>
</tr>
<tr>
<td>Good</td>
<td>11</td>
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<tr>
<td>Risk</td>
<td>70</td>
</tr>
<tr>
<td>Low</td>
<td>15</td>
</tr>
<tr>
<td>BMI, ka</td>
<td>28 (17-41)</td>
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<tr>
<td>Meals on wheels, %</td>
<td>81</td>
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<tr>
<td></td>
<td>Beginning N=26</td>
</tr>
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<td>----------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Energy, kcal (sd)</td>
<td>1 335 (400)</td>
</tr>
<tr>
<td>Protein, g (sd)</td>
<td>55 (18)</td>
</tr>
<tr>
<td>Calsium, mg (sd)</td>
<td>739 (373)</td>
</tr>
<tr>
<td>C-vitamin, mg (sd)</td>
<td>84 (83)</td>
</tr>
<tr>
<td>E-vitamin, mg (sd)</td>
<td>7.6 (4.4)</td>
</tr>
<tr>
<td>Folat, µg (sd)</td>
<td>210 (96)</td>
</tr>
</tbody>
</table>


• Suominen MH, Puranen T, Jyvakorpi S, Eloniemi-Sulkava U, Kautiainen H, Pitkala KH. Tailored nutrition guidance improves nutrient intake of Alzheimer’s patients living at home with their spouses. RCT trial (NuAd), submitted.

• Puranen T, Eloniemi-Sulkava U, Pitkala KH, Suominen MH. Tailored nutritional guidance for home-dwelling AD families: feasibility and elements promoting good nutrition leading to improved nutrition and quality of life.
Thank you!