Weight trajectories and health in late life: a life course approach

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More than 50% of the European adult population is overweight or obese.

The negative effect of being obese in midlife is well-known.
In Old Age

“Obesity in older persons has unique implications that have not yet been adequately explored”

Ferrucci et. al., 2010

The usefulness of the current WHO BMI recommendations in old age are questioned
Obesity Paradox

- Being overweight or obese in midlife is associated with decreased survival

- Being overweight or obese have been associated with lower mortality risk in late life

  (Heiat, et. al., Arch Int Med, 2001; Janssen & Mark, Obe Rew 2007)
A high BMI in midlife is associated with an increased risk of …

- Adjusted for age, edu., smoking, and alcohol habits
- Additionally adjusted for cardio metabolic diseases

Hassing, Dahl, et al., Int J Obesity, 2009
A normal BMI in late life is associated with an increased risk of dementia.

Dahl, Löppönen et al., JAGS, 2008
Life Course Perspective

- Patterns

- Weight change
  - Weight changes might be a prodromodal sign of dementia, other diseases, or mortality

- Delayed effects

- Time windows
Swedish Longitudinal Twin Studies on Ageing

- Swedish Adoption/Twin Study of Aging (SATSA)
- Origins of Variance in the Old-Old (OCTO-twin)
- Ageing in Women and Men: A Longitudinal Study of Gender Differences in Health Behaviour and Health among Elderly (the Gender Study)

Totally 2211 persons
Collected over 50 years
### Trajectory of BMI for men

<table>
<thead>
<tr>
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<th>Men</th>
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<tbody>
<tr>
<td>μ</td>
<td>V</td>
</tr>
<tr>
<td>L</td>
<td>26.42</td>
</tr>
<tr>
<td>S_A</td>
<td>0.09</td>
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<tr>
<td>S_B</td>
<td>-0.02</td>
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<tr>
<td>S_C</td>
<td>-0.08</td>
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<tr>
<td></td>
<td>Women</td>
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<td>S_B</td>
<td>0.00</td>
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<tr>
<td>S_C</td>
<td>-1.14</td>
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</tbody>
</table>

**Trajectory of BMI for women**

- **Age**
- **BMI**

- The table above shows the mean (μ) and variance (V) values for BMI trajectory among women, along with standard deviations (S_A, S_B, S_C) for different age groups.
Late life BMI and cognitive change

Controlling for change in BMI

Dahl, Hassing, et. al., Epub a head of print, Int J Obesity
Patterns of BMI

- The consistently underweight group performed significantly worse on mean verbal abilities and memory, -5.8 (SE 1.9), \( p = 0.003 \), and -6.6 (SE 2.1), \( p = 0.002 \), respectively.

- The consistently overweight/obese group scored significantly worse across domains, with the estimates rather similar for all four cognitive domains (range -2.2 to -1.7).
Direction of the association

- Low cognitive abilities in early life have been associated with higher risk of obesity.

Review of 11 articles (7 assessing BMI in midlife and 4 in late life)

- The direction of the association remain to be elucidated

(Dahl & Hassing, Accepted for publication in Epidemiological Reviews, Special Issue on Ageing 2013)
Causal pathways

- Shared genetic variance between obesity and lower cognitive abilities?
- FTO and other obesity related genes
Unstandardized Variance Components: Men

- VA (Additive Genetic)
- VS (Rearing Env)
- VE (Nonshared Env)
Unstandardized Variance Components: Women

- VA (Additive Genetic)
- VE (Nonshared Env)
FTO and other obesity associated genes

- Stronger influence on BMI among men than among women
- Stronger influence on BMI in early life
- Environmental factors such as smoking and diseases such as diabetes are strongly related to the BMI trajectory in early and late life
- In late life dementia is associated to the BMI trajectory among women
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Data collection

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Data analyses

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Thank You for Your Attention!

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