Which life event domains are associated with dementia risk?

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Research Questions

- Are there multiple domains represented in a life event measure and if so, which domains are associated with dementia? How strongly?

Background

- Negative life events correlate with dementia risk.
- Life event measures index stress but also encompass other factors:
  - Social engagement, socioeconomic conditions, and physical health.
  - Life events consist of factors considered to raise dementia risk[1].
- It is unclear whether life event domains are differentially related to dementia risk.

Methods

- **Participants**
  - 885 families of same-sex MZ/DZ twins ≥ 50 years (range: 50.1 – 92.9 years) from the Swedish Adoption/Twin Study of Aging (SATSA) measured between 1 – 3 occasions from 1984 to 1990[2].
  - 15.06% of the sample received a dementia diagnosis ≥ 1990.
- **Measures**
  - ***Life events***
  - A 25-item negative and positive life event scale assessing whether life events ever occurred up to 1990[3,4].
  - ***Dementia diagnosis***
  - Clinical and registry sources of diagnosis[5,6]:
    - *Clinical* – Cognitive screening administered (cognitive battery, including MMSE *and/or* TELE screening).
      - A diagnostic consensus board assigned a consensus clinical diagnosis (DSM-III-R and DSM-IV criteria for dementia and NINCDS-ADRDA criteria for AD).
    - *Registry* – All who did not receive a cognitive screening or lost to follow-up were linked to the Swedish National Patient Register (NPR) and Cause of Death Register (CDR) containing International Classification of Disease (ICD) dementia codes.
    - Twins who were diagnosed with dementia < 1990 were excluded from this study.
    - *Controls* – Those who did not screen positive through any of these means were assumed to be non-demented and due for follow-up in three years.
- **Data Analysis**
  - Preliminary analyses:
    - Exploratory Factor Analysis of 25 life event items (*not shown*)
    - Confirmatory Factor Analysis of 22 life event items (*Table 1*)
  - Total phenotypic effect of resulting 6 life event factors on binary dementia variable (*Table 2*)

Results

Table 1. Confirmatory factor analysis of life event items revealed 6 latent factors

Life Events	Multidomain Loss	NLE Children	Illness of Self	Family Strife	NLE Spouse	Positive LE
Retirement after employment	0.83					
Loss of sexual ability or interest	0.74					
Death of siblings or friends	0.69					
Major detioration in financial status	0.53					
Serious illness in child		0.80				
Death of child		0.65				
Home care, self			0.90			
Forced change in residence b/c one can't manage to look after oneself			0.84			
Mental illness, self			0.60			
Forced change in residence with reduced contact			0.50			
Deterioration in married life				0.97		
Divorce				0.73		
Serious conflicts with child				0.67		
Home care of spouse by proband					0.89	
Nursing home care, spouse					0.84	
Somatic illness, spouse					0.82	
Death of spouse					0.79	
Mental illness, spouse					0.57	
Getting married						0.74
Making an acquaintance						0.70
Major improvement in financial status						0.65
Improvement in married life						0.62

Table 2. Correlations between life event domains and dementia revealed only *multidomain loss* and *negative spousal events* are associated with dementia risk

Phenotype	Estimate	SE	P-value
Multidomain Loss	**0.143**	**0.049**	**0.003**
NLE Children	0.029	0.112	0.793
Illness of Self	-0.049	0.075	0.511
Family Strife	-0.016	0.062	0.797
NLE Spouse	**0.098**	**0.049**	**0.045**
Positive Life Events	0.094	0.089	0.286

- Factor analysis determined that items encompass 6 domains: multidomain loss; negative life events of children; illness of self; family strife; negative life events of spouse; and positive life events.
- Correlation between life events and dementia observed for two life events, multidomain loss and negative spousal events. Both domains are positively associated with dementia risk, albeit weakly.

Conclusions

- Empirically derived 6 latent life event factors – 5 negative life event domains and 1 positive life event domain.
- Two domains (multidomain loss and negative spousal events) positively correlate with dementia diagnosis
  - Literature on dementia risk factors (e.g. retirement, fewer social ties, lowered SES, caregiving, widowhood) support these correlations.
- Significant correlations may result from factors that affect healthy aging and dementia risk (deterioration of physical, cognitive, social, and occupational status).
- Direction of causation cannot be established from correlations.
- Next steps include fitting biometric models that account for confounding social selection factors as well as test for a quasi-causal association for all life event domains and dementia risk.

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