



Gender, Social Connections and Health

New findings and practice implications

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Topics covered

- Review the science of social connections and survival
- Gaps in heart disease research on social connections
- New results on cardiovascular risk factors, by gender
- Implications for Social Rx programs and practice



Our brain and biology are shaped to be social

Humans have a homeostatic need for social contact supported by 3 neural networks in the brain



Cortisol-Adrenaline elicits stress response to social isolation or is buffered by social connection

Dopamine helps us to feel good when we connect with others

Social cognition helps us to understand what people are doing (tells us how to interact)



Adaptation to feelings of loneliness

Feelings of loneliness are an adaptive signal, like hunger and thirst, to being isolated from others, but it puts your brain into hyper-vigilance for social threats



Loneliness and Social Connections: A National Survey of Adults 45 and Older



Social connection & mortality

Higher odds of **survival** for those who are MORE socially connected (Holt-Lunstad et al, 2010)

| Type of Measure | | k | OR | 95% CI | |
|---|-------------------|--|----|--------|--------------|
| N=24 | <i>Functional</i> | Received social support | 9 | 1.22 | [0.91, 1.63] |
| | | Perceptions of social support | 73 | 1.35 | [1.22, 1.49] |
| | | Loneliness (inversed) | 8 | 1.45 | [1.08, 1.94] |
| 1.46 (1.66, 5.56) | | | | | |
| N=63 | <i>Structural</i> | Living alone (inversed) | 17 | 1.19 | [0.99, 1.44] |
| | | Marital status (married versus other) | 62 | 1.33 | [1.20, 1.48] |
| | | Social isolation (inversed) | 8 | 1.40 | [1.06, 1.86] |
| | | Social networks | 71 | 1.45 | [1.32, 1.59] |
| | | Social integration | 45 | 1.52 | [1.36, 1.69] |
| | | Complex measures of social integration | 30 | 1.91 | [1.63, 2.23] |
| 1.57 (1.70, 11.39) | | | | | |
| <i>Combined structural and functional</i> | | Multifaceted measurement | 67 | 1.47 | [1.34, 1.60] |

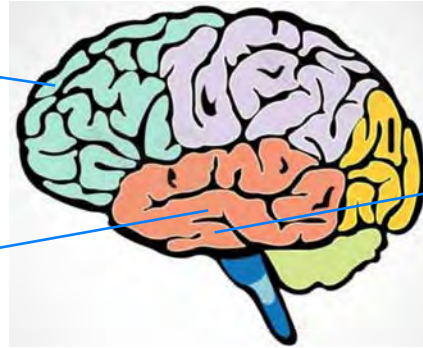
Higher odds of **death** for those who LACK a social connection (Holt-Lunstad et al. 2015)

| Measure | k | OR _L | SE | 95% CI |
|----------------------|----|-----------------|-------|--------------|
| Fully adjusted data* | | | | |
| Social isolation | 14 | 1.29 | 0.100 | [1.06, 1.56] |
| Living alone | 25 | 1.32 | 0.075 | [1.14, 1.53] |
| Loneliness | 13 | 1.26 | 0.099 | [1.04, 1.53] |
| Overall | 52 | 1.30 | 0.116 | [1.16, 1.46] |



Social connection & brain health

Prefrontal
cortex



Amygdala

Hippocampus

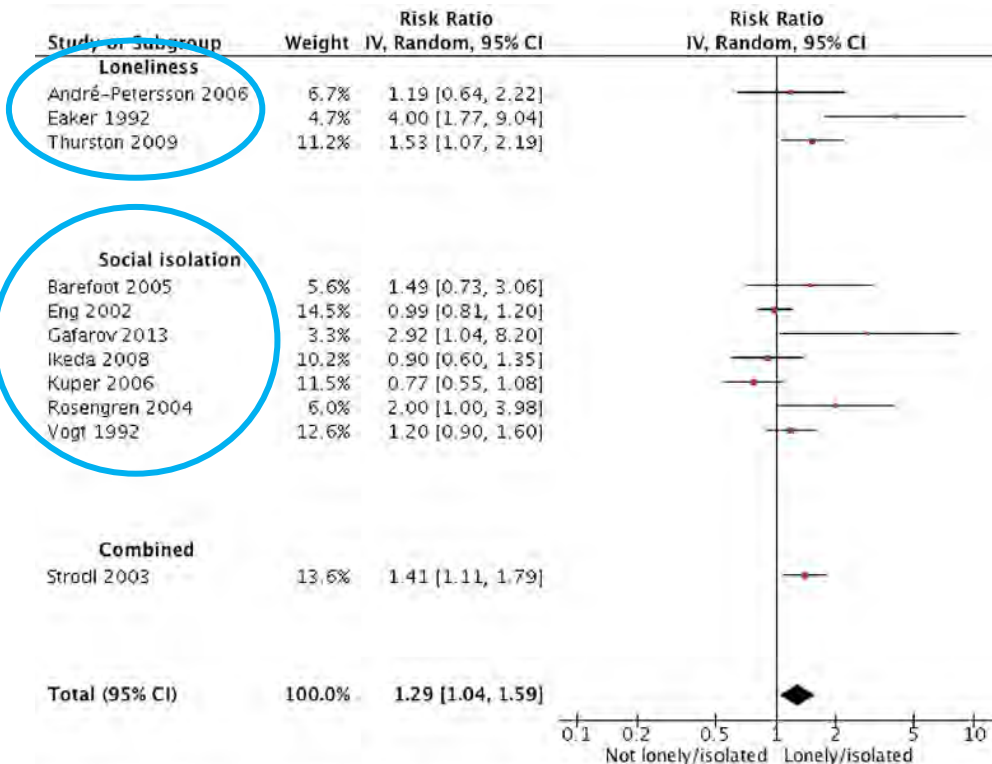
- 80-Year Harvard study on Happiness: 724 men with stronger relationships in early life had better memory in later life
- 2016 AARP Social engagement brain health survey: 4 in 10 (37%) of adults surveyed lacked social connections and reported worse brain health
- Lower frequency of social contact is linked to declines in total and cognitive function related to regional brain volumes (possibly mediated by depression)



Social connection & heart health

11 studies on incident coronary heart disease (CHD) & 8 on stroke

Poor social relationships increased risk of incident CHD by 29% & stroke by 32%



How often do you feel:
1-lack companionship
2-left out
3-isolated from others

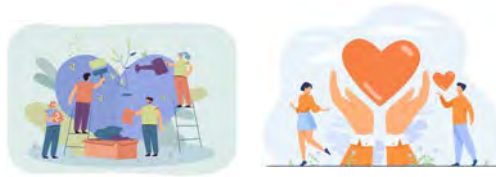
Social Isolation Index:
1-not married or live alone
2-contact with kids <1/mo
3-contact with family <1/mo
4-contact with friends <1/mo
5-social participation <1/mo

Heterogeneity: Tau² = 0.07; Chi² = 29.16, df = 10 (P = 0.001); I² = 66%
Test for overall effect: Z = 2.35 (P = 0.02)

Social connections has 2 domains

Functional = what is provided or perceived to be available (**subjective**)

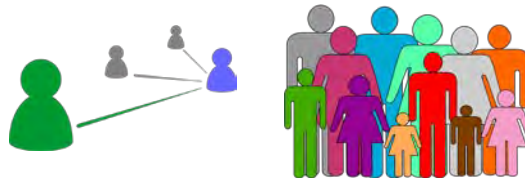
- Perceptions of social support, received social support, *feelings of loneliness*
 - Social support behavior scale, Malmo social support scale, UCLA loneliness scale, etc.



Low sense of control

Structural = existence (i.e. number) of social ties and roles (**objective**)

- *Social network size, friend/family contact, social activities, living alone, marital status*
 - Social isolation scale, social network index, etc.

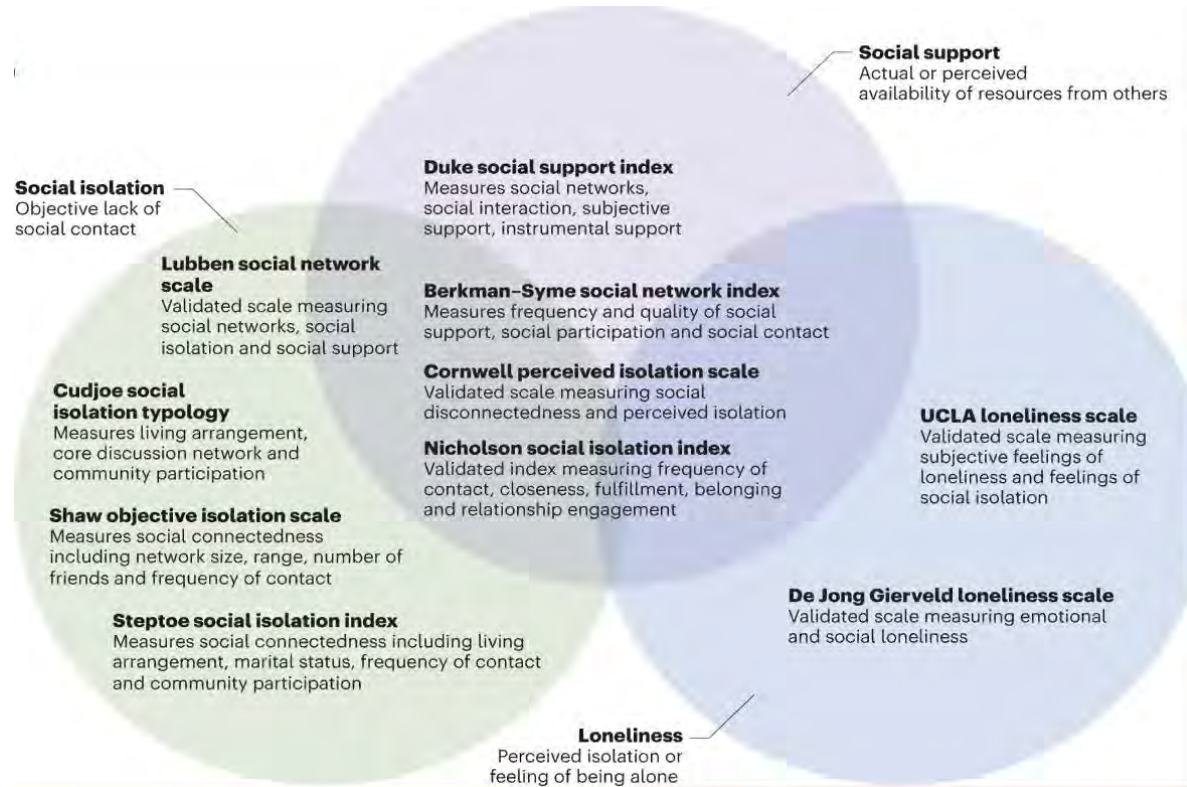


May be chosen (“solitude”)



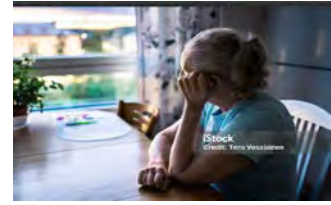
Limitations of the science & understanding

No standard measure of “social isolation”; many indices combine different types of connections





Limitations of the science & understanding



Terms used as synonymous: Social isolation = living alone = feeling lonely

- Well connected people (including married) can live alone
- A person living with a partner may still feel lonely

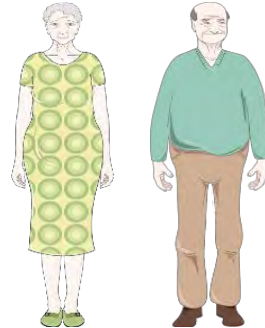
Social ties are dynamic: Social factors measured only once

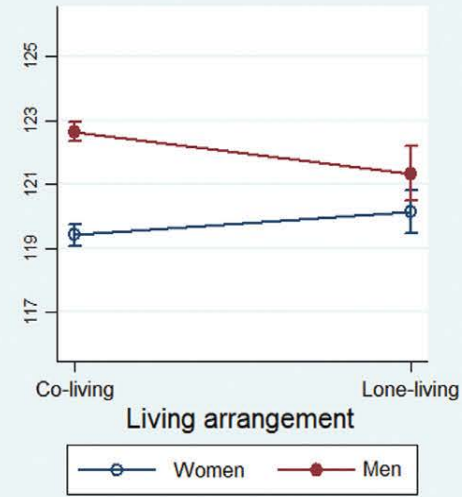
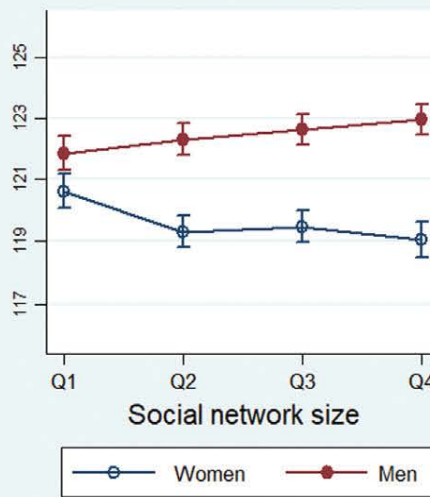
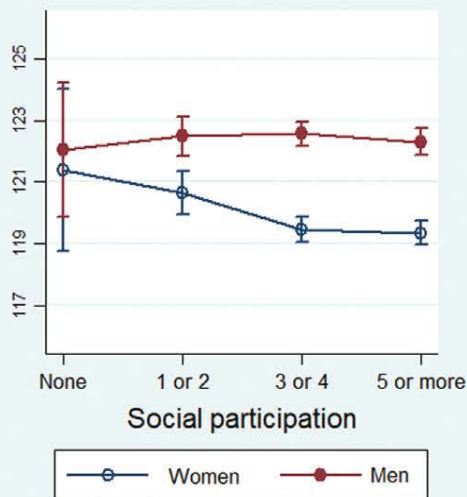
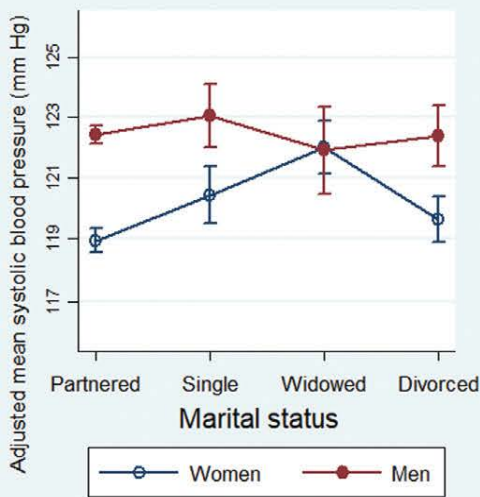
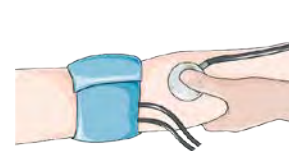
- Older adults often lose family/ friends/ peers over time
- Risks of loss or chronic lack differ by gender and socioeconomic status (SES)



Gender matters: Health literature on social ties rarely separates results

- Older women more likely to live alone, become widowed, or stay unpartnered
- Different social contacts or activities have gender-specific role-identities





Marital status & hypertension: higher odds in single, widowed & divorced **women** (OR 1.21 to 1.33)

Social participation & hypertension: higher odds in women with 0 & 1-2 monthly activity (OR 1.30; 1.22)

Social network size & hypertension: higher odds in **women** with smallest network (OR 1.15)

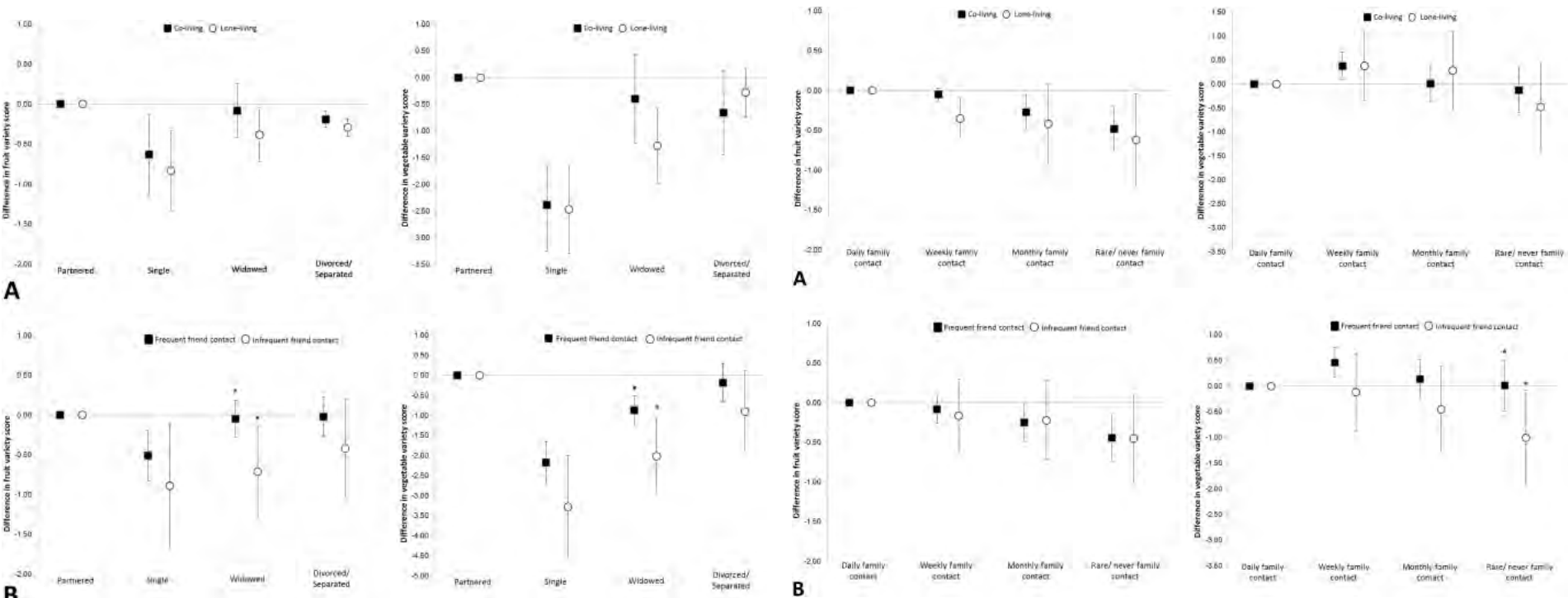
Living arrangement & hypertension: *lower* odds in lone-living **men** (OR 0.85)



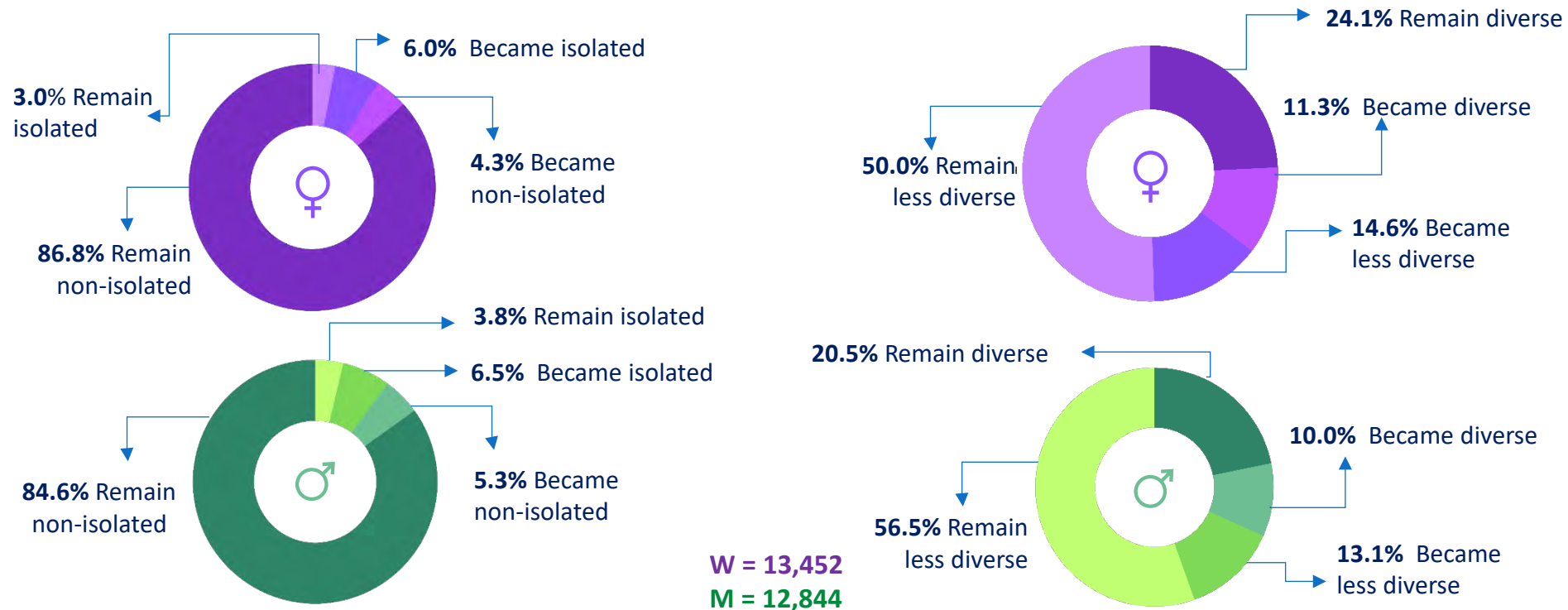
New findings: social ties have interacting effects on diet quality



Co-living & frequent friend contact alter how marital status and family contact affect F&V

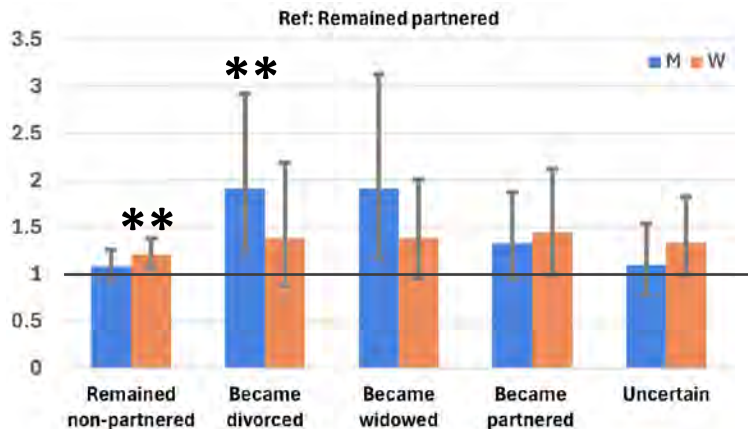


- Aging brings different changes in social isolation and diversity



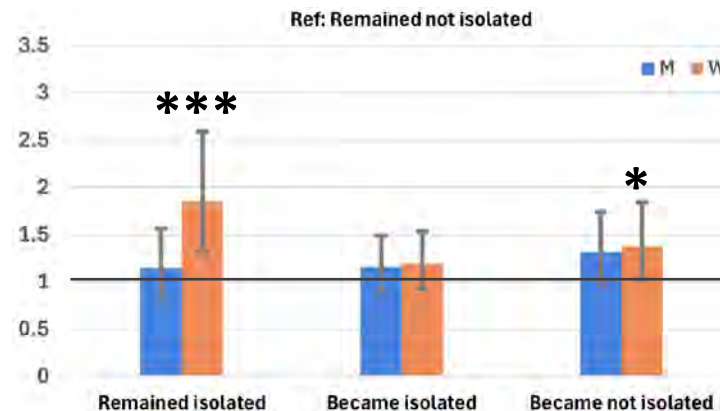
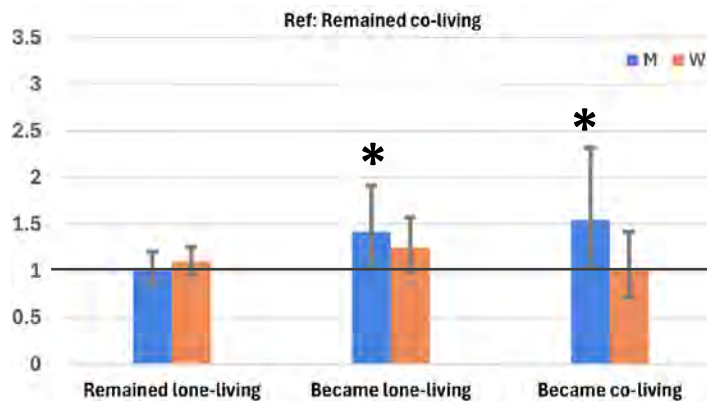


Odds ratios (95% CI) of non-daily vegetable intake

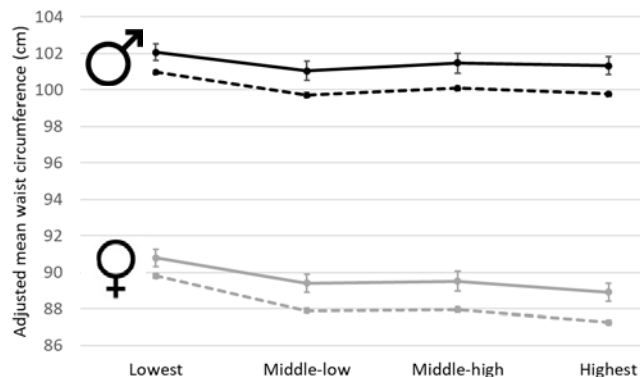


Mehranfar et al. *Nutrients* 2025a;
Int J Behav Nutr Phys Act 2025b

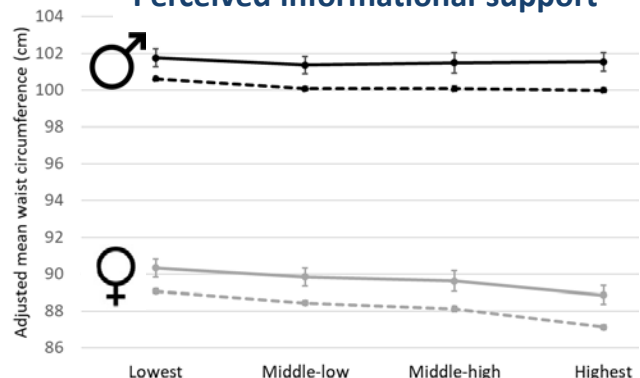
Odds ratios obtained from multilevel random-coefficient logistic regression with an interaction (cisgender x transition variable) and covariable adjustment (study duration, age, biological and health factors, socioeconomic factors, behavioral, and provincial-level variables). Smallest analytic sample: n = 15,672



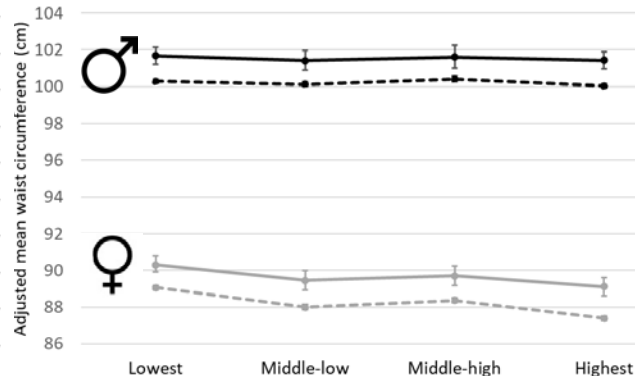
New findings: different social supports have unique effects on waistlines (cm)



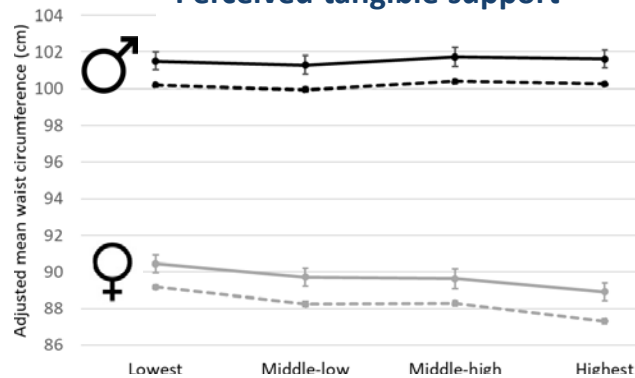
Perceived informational support



Perceived emotional support



Perceived tangible support



Perceived belonging support

- 4 types of social support, each linked to WC in **women**
- Models adjusted for other factors and for other social supports (dashed line)
- Overall, effects are small



Practice implications – Social Rx

A variety of non-medical community supports (e.g., Rx to exercise groups, befriending program) → informational support & tangible support

“Overall, the current evidence base is too weak to draw robust conclusions, with evaluations hindered by uncontrolled study designs, short timeframes, and small sample sizes.” (*Lancet*, July 2025)

1. **Need high-quality research** with standardised and validated outcome measures to ensure recommendations are evidence-based and equitable (e.g., gender, age)
2. Does not address wider structures (economic and social) that shape health and wellbeing



Practice implications - measuring

- Functional social connections: feel lonely, receive 4 social supports
- Structured social connections:
 - Single vs. widowed vs. divorced (differs by gender)
 - Solo living
 - Number & **variety** of monthly social activity
 1. Family- or friendship-based activities outside the household
 2. Church or religious activities such as services, committees or choirs
 3. Sports or physical activities done with other people
 4. Educational and cultural (e.g., attending courses, concerts, plays, visiting museums)
 5. Service club or fraternal organization (e.g., Lion's club, Royal Canadian Legion, Rotary)
 6. Neighbourhood, community or professional association
 7. Volunteer or charity work
 8. Any other recreational activities with others (e.g., hobbies, gardening, poker, bridge, cards and other games)





Practice implications - screening

Identify at-risk 'social frailty' in older adults based on:

1. multiple types
 - partnership \neq cohabitation \neq friend contact \neq network size \neq social activity
2. combinations of social ties
 - Live alone + single / living alone + widowed
 - Live alone + rare family contact
 - Infrequent friend contact (< 1/month) + non-partnered
 - Infrequent friend contact + rare family contact
 - Single/widowed/divorced + monthly social activities
3. trajectories in each type of social tie
 - Loss OR persistent lack OR (sometimes) gain in social connection



Practice implications - tailoring

Tailoring social Rx to provide gender-specific supports or services, e.g.:

- Women may benefit from multiple social supports (informational, tangible, emotional & belonging)
- Women may benefit from a variety of different activities or contacts
- Men may benefit from programs to help with changes in cohabitation or with being or becoming unpartnered

And supports for women or men may need to also be tailored by socio-economic status..... more data to come!



Key takeaways

1. Literature confirms that not being or feeling connected is bad for our health, but has many limitations (no gender data or time)
2. Different types of structured (and functional) social ties, and their changes, matter for health, in specific ways for women and men
3. Implications for practice: more research with better measurement, more specific and nuanced screening & services need to be tailored to subgroups of older adults



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