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Factors associated with developing high nutrition risk: data from the CLSA

Christine Marie Mills, RD, MPH, PhD

Provost's Interdisciplinary Postdoctoral Scholar



UNIVERSITY OF
WATERLOO

FACULTY OF HEALTH
**Kinesiology and
Health Sciences**

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Article

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Corresponding author:

La correspondance et les demandes de tirés-à-part doivent être adressées à : /
Correspondence and requests for offprints should be sent to: Christine Marie Mills, 200 University Avenue West, Waterloo, ON, Canada N2L 3G1 (Christine.mills@queensu.ca).

Factors Associated with the Development of High Nutrition Risk: Data from the Canadian Longitudinal Study on Aging

Christine Marie Mills¹ , Heather H. Keller² , Vincent Gerard DePaul³ and Catherine Donnelly³

¹Faculty of Health Sciences, School of Rehabilitation Therapy, Aging and Health Program, Queen's University, Kingston, ON, Canada, ²Schlegel-UW Research Institute for Aging and Department of Kinesiology & Health Sciences, University of Waterloo, Waterloo, ON, Canada and ³School of Rehabilitation Therapy and Health Services and Policy Research Institute, Queen's University, Kingston, ON, Canada

Résumé

Cette étude basée sur des données de l'Étude longitudinale canadienne sur le vieillissement visait à déterminer quelles variables liées au réseau social, aux données démographiques et aux indicateurs de santé pouvaient permettre de prédire le développement d'un risque nutritionnel élevé chez les adultes canadiens d'âge mûr et plus âgés. Une régression logistique binomiale multivariée a été utilisée pour examiner les facteurs prédictifs du développement d'un risque nutritionnel élevé lors du suivi, trois ans après le début de l'étude. Au départ, 35,0 % des participants présentaient un risque nutritionnel élevé contre 42,2 % lors du suivi. Des niveaux inférieurs de soutien social, une participation sociale plus faible, la dépression et un niveau médiocre de vieillissement en bonne santé auto-évalué ont été associés au développement d'un risque nutritionnel élevé lors du suivi. Les personnes présentant ces facteurs devraient faire l'objet d'un dépistage proactif de risque nutritionnel.

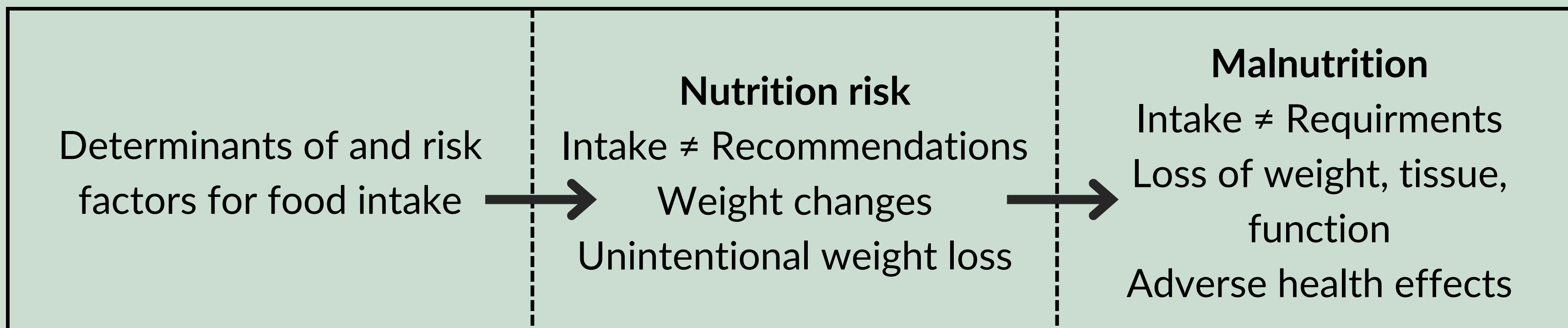
Abstract

This study aimed to determine which social network, demographic, and health-indicator variables were able to predict the development of high nutrition risk in Canadian adults at midlife and beyond, using data from the Canadian Longitudinal Study on Aging. Multivariable binomial logistic regression was used to examine the predictors of the development of high nutrition risk at follow-up, 3 years after baseline. At baseline, 35.0 per cent of participants were at high nutrition risk and 42.2 per cent were at high risk at follow-up. Lower levels of social support, lower social participation, depression, and poor self-rated healthy aging were associated with the development of high nutrition risk at follow-up. Individuals showing these factors should be screened proactively for nutrition risk.



NUTRITION RISK

- No agreed-upon definition
- Risk of poor dietary intake and nutrition status
- Risk of malnutrition
- “Represents the determinants and risk factors that place an individual at risk for poor food intake and if not interrupted, can lead to malnutrition” (Keller n.d.)



(adapted from Keller 2019)

NUTRITION RISK

- Risk factors:
 - Food insecurity
 - Dysphagia
 - Poor dentition / other chewing problems
- Physiological, psychological, social changes

Can all lead to:

- Low appetite
- Low food intake



CONSEQUENCES OF NUTRITION RISK

- ↑ Frailty
 - Medical condition of reduced function and health in older individuals
- ↓ Quality of life
- ↑ Hospitalization
- ↑ Death



SOCIAL FACTORS

- eating alone associated with high nutrition risk (Bloom et al 2017, Keller & McKenzie 2003)
- social support reduces nutrition risk (Keller 2005)
 - low levels of social support associated with increased nutrition risk (Ramage-Morin & Garriguet 2013, Locher & Sharkey 2009)
- infrequent social participation associated with high nutrition risk (Ramage-Morin & Garriguet 2013)
- loneliness associated with high nutrition risk during COVID-19 restrictions (Wei et al 2022)



LONGITUDINAL STUDIES

- 1-year longitudinal study (Roberts et al, 2007)
 - Poor self-rated health predicted elevated nutrition risk
- 18-month longitudinal study (Keller, 2006)
 - Meal programs improved nutrition risk scores
 - Depression associated with increased nutrition risk
- 4-year longitudinal study (Lengyel et al, 2017)
 - Five trajectories of nutrition risk in older men
 - Differed on mental health, physical aging, self-perceived successful aging, living alone

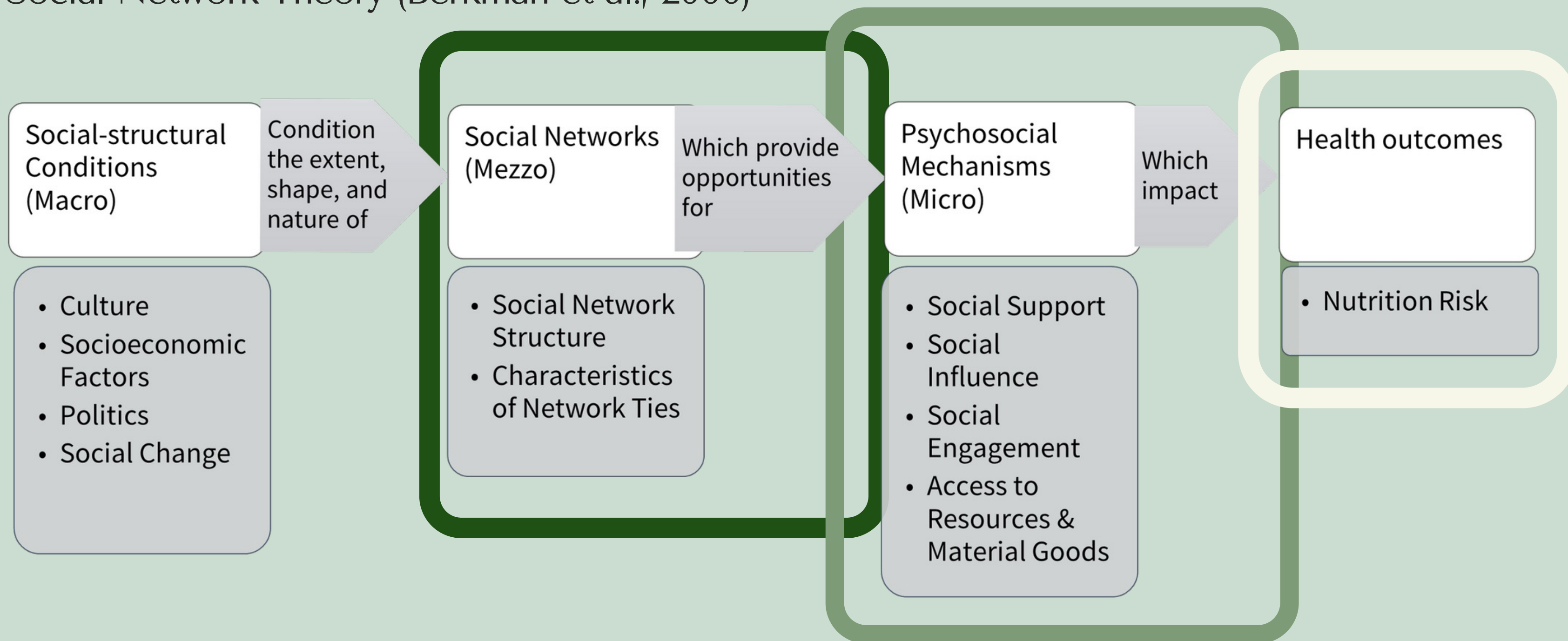


PURPOSE OF CURRENT STUDY

- Objective: To determine which **social network factors** are associated with the development of **high nutrition risk** at follow-up in individuals who were not at high nutrition risk at baseline, using a nationally representative sample of community-dwelling Canadians aged 45 and older from the Canadian Longitudinal Study on Aging
 - Using a theoretical framework



Social Network Theory (Berkman et al., 2000)



DATA SOURCE - CANADIAN LONGITUDINAL STUDY ON AGING

- > 50,000 Canadians aged 45+
- Two cohorts: tracking and comprehensive
- Tracking – 21,241 individuals at baseline
 - Followed by telephone interview only
 - Representative of each province's population
- Data from first two waves
 - Baseline (2010-2015)
 - First follow-up (follow-up) (3 years after baseline)



Mapping CLSA Measures onto Berkman and colleagues' (2000) social network theory

Social Network Theory	CLSA Measures
Social networks (mezzo level)	
Social network structure <ul style="list-style-type: none">• Size• Range	<ul style="list-style-type: none">• Number of friends, siblings, relatives, neighbours, children• Number of people known through work or school, community activities, other activities
Characteristics of network ties <ul style="list-style-type: none">• Frequency of face-to-face contact	<ul style="list-style-type: none">• Frequency of contact with friends, siblings, relatives, neighbours, children

Mapping CLSA Measures onto Berkman and colleagues' (2000) social network theory

Social Network Theory	CLSA Measures
Psychosocial mechanisms (micro level)	
Social support	<ul style="list-style-type: none">• Medical Outcomes Study (MOS) Social Support Survey
Social engagement	<ul style="list-style-type: none">• Social participation
Access to resources and material goods	<ul style="list-style-type: none">• Household income• Self-rate social standing

MEASURES

- **Social network size:** number of individuals in each of these groups:
 - Children
 - Siblings
 - Close friends
 - Relatives
 - Neighbours
 - People known through work or school
 - People known through community involvement
 - People known through other activities



MEASURES

- **Frequency of contact with network members: last get together with (face-to-face):**
 - Children
 - Siblings
 - Close friends
 - Relatives
 - Neighbours



MEASURES

- **Social participation:** frequency of participation in:
 - Family/friend activities
 - Religious activities
 - Sports or physical activity with others
 - Education or cultural activities
 - Clubs or fraternal organizations
 - Association activities
 - Volunteer or charity work
 - Other recreational activities



MEASURES

- **Social support:** Medical Outcomes Study Social Support Survey:
 - Measures:
 - Affection
 - Emotional and informational support
 - Tangible social support
 - Positive social interaction
 - Excellent internal consistency
 - Excellent test-retest reliability



MEASURES

- **Self-rated social standing:**
 - Participants asked:
 - Think of a ladder with 10 steps as representing where people stand in their communities
 - At the top of the ladder (or step 10) are the people who have the highest standing in their community.
 - At the bottom (or step 1) are the people who have the lowest standing in their community
 - Participants were asked, “On which step would you place yourself on this ladder?”



MEASURES

- **Household income:** Participants reported their annual household income:
 - Less than \$20,000
 - \$20,000 - \$49,999
 - \$50,000 - \$99,999
 - \$100,000 or more



COVARIATES

- **Demographics:**

- Age
- Sex assigned at birth
 - Male
 - Female
- Marital status
 - Married/partnered
 - Single
 - Widowed
- Educational attainment
 - Less than secondary
 - Completed secondary
 - Some post-secondary
 - Completed post-secondary
- Living situation
 - Lives alone
 - Lives with others

COVARIATES

- Health variables
 - Depression
 - Center for Epidemiologic Studies – Depression (CES-D10)
 - Disability
 - Older Americans Resources and Services (OARS) Multidimensional Assessment Questionnaire
 - Self-rated general health
 - Self-rated mental health
 - Self-rated oral health
 - Self-rated healthy aging

Participants were asked to rate these as excellent, very good, good, fair, or poor



HEALTH OUTCOME

- **Nutrition risk**
- **SCREEN-8**
 - Valid, reliable tool
 - Good specificity and sensitivity compared to dietitians' assessment
 - Eight questions
 - Weight change, meal skipping, appetite, swallowing, fruit and vegetables, fluid, eating with others, meal preparation
 - Higher scores = lower nutrition risk
- **SCREEN-8 < 38 = high nutrition risk**
- Available at: <https://olderadultnutritionscreening.com/>



DATA ANALYSIS

- Individuals not at high nutrition risk at baseline (n = 11,032)
- Binary multivariable logistic regression
 - Outcome: presence or absence of high nutrition risk at follow-up
- Social network variables
- Covariates: demographic and health variables
- Three models:
 - Social network variables
 - Social network and demographic variables
 - Social network, demographic, and health variables



Sample description

- 17,051 individuals provided data at follow-up
- 11,032 individuals not at high nutrition risk at baseline
- Mean age: 59.46 (SD=9.94)
- 51.8% female
- 76.5% married or partnered
- At baseline: 36.5% at high nutrition risk
- At follow-up: 42.2% at high nutrition risk
- 27.4% (n = 3023) of those not at high risk at baseline developed high nutrition risk at follow-up



Characteristics	Social network variables	+ Demographic variables	+ Health variables
Social participation	✓	✓	✓
Self-rated social standing	✓	✓	✓
Social support	✓	✓	✓
Household income	✓		

✓ = statistically significant predictor of the development of high nutrition risk

Characteristics	Odds ratio	p-value
Social participation	0.98	0.002
Self-rated social standing	0.96	0.027
Social support	0.99	<0.001
Depression	1.358	<0.001
Self-rated healthy aging <ul style="list-style-type: none"> • Very good / excellent • Good • Fair / poor 	- 1.488 1.694	<0.001
Self-rated oral health <ul style="list-style-type: none"> • Very good / excellent • Good 	- 1.265	0.001

Odds ratios < 1 – odds of developing high nutrition risk decrease
Odds ratios > 1 – odds of developing high nutrition risk increase

High proportion of Canadians at high nutrition risk

- 36.5% at baseline
- 42.2% at follow-up
 - Similar to previous studies:
 - 32.5% 55+ (Morrison et al. 2019)
 - 34.2% 65+ (Ramage-Morin & Garriguet 2013)
- 27.4% developed high nutrition risk between baseline and follow-up
 - CLSA study that used comprehensive cohort:
 - 17.3% developed high nutrition risk (Keller & Trinca 2023)



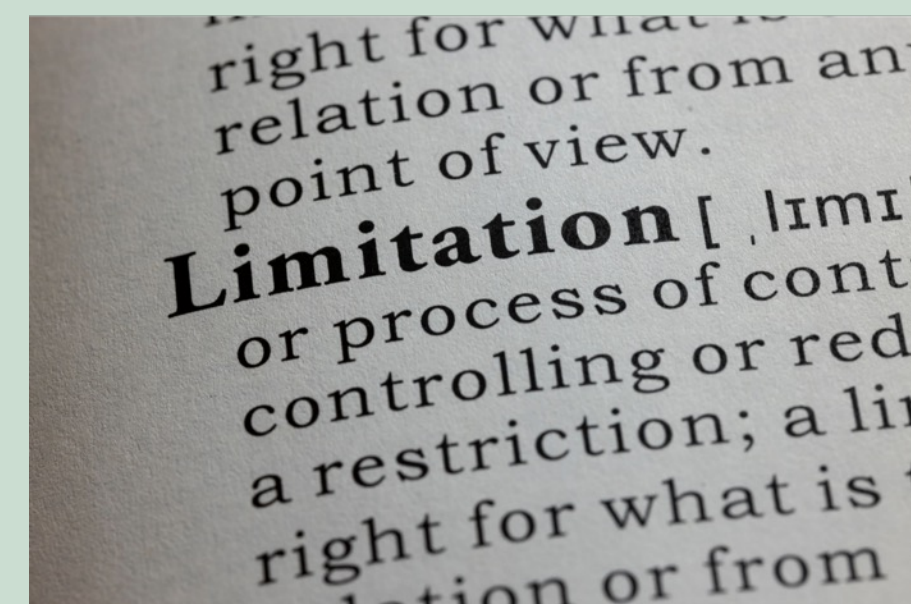
Strengths

- CLSA data
 - tracking cohort representative of Canadian provincial populations
 - valid and reliable measures
 - large sample
 - two waves: able to examine nutrition risk longitudinally
- Use of a theoretical framework



Limitations

- CLSA tracking cohort
 - does not include:
 - Full-time members of the Canadian Armed Forces
 - Individuals living in the territories and some remote areas
 - Individuals living on First Nations reserves and settlements
 - largely white (97.4%)
 - English or French speaking
- Frequency of contact with network members variables: only face-to-face contact with network members
- SCREEN-8: validity and reliability only established for 50+



Social factors associated with the development of high nutrition risk

- Low social support
- Low social participation
- Low self-rated social standing
- Low income

To reduce the prevalence of high nutrition risk:

- Programs and policies designed to:
 - Provide social support
 - Foster social participation
 - Provide adequate income
- Screen individuals with low social support, low social participation, low social standing, low income proactively for nutrition risk



Health factors associated with the development of high nutrition risk

- Depression
- Low self-rated healthy aging

To reduce the prevalence of high nutrition risk:

- Identify and address depression
- Design programs and policies to encourage healthy aging
- Screen individuals with depression and low self-rated healthy aging proactively for nutrition risk



Future research with CLSA data

- Examine nutrition risk and the development of high nutrition risk by age group – papers under review
- Examine additional factors associated with high nutrition risk and the development of high nutrition risk
- Future waves:
 - Continue to examine nutrition risk longitudinally
 - Describe trajectories of nutrition risk over time
 - Examine how nutrition risk changes as adults at midlife move into older adulthood




Related work

Open access

Original research

Family Medicine and
Community Health**Nutrition risk varies according to social network type: data from the Canadian Longitudinal Study on Aging**

Christine Marie Mills ¹, Heather H Keller,^{2,3} Vincent Gerard DePaul,^{1,4}
Catherine Donnelly^{1,4}



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Original Research

Social Network Factors Affect Nutrition Risk in Middle-Aged and Older Adults: Results from the Canadian Longitudinal Study on Aging

C.M. Mills¹, H.H. Keller², V.G. DePaul^{1,3}, C. Donnelly^{1,3}



Upcoming: Social factors associated with changes in nutrition risk scores measured using SCREEN-8: data from the Canadian Longitudinal Study on Aging - CJDPR

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- Queen's Graduate Awards and Research Fellowships



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March is Nutrition Month!

- March 20th – Dietitians Day





Thank you!

Nutrition and Aging Lab

<https://uwaterloo.ca/nutrition-and-aging-lab/>

