Arthritis is associated with high nutritional risk among older Canadian adults from the Canadian Longitudinal Study on Aging

Presented by:

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Arthritis

Arthritis is a **leading cause of disability**, and its impact is growing with aging populations.

- Category of conditions causing inflammation, pain and/or stiffness in the joints
- Encompasses over 100 types of arthropathies
- Disease management, no known cure
- The most common: Osteoarthritis (OA) and Rheumatoid Arthritis (RA)

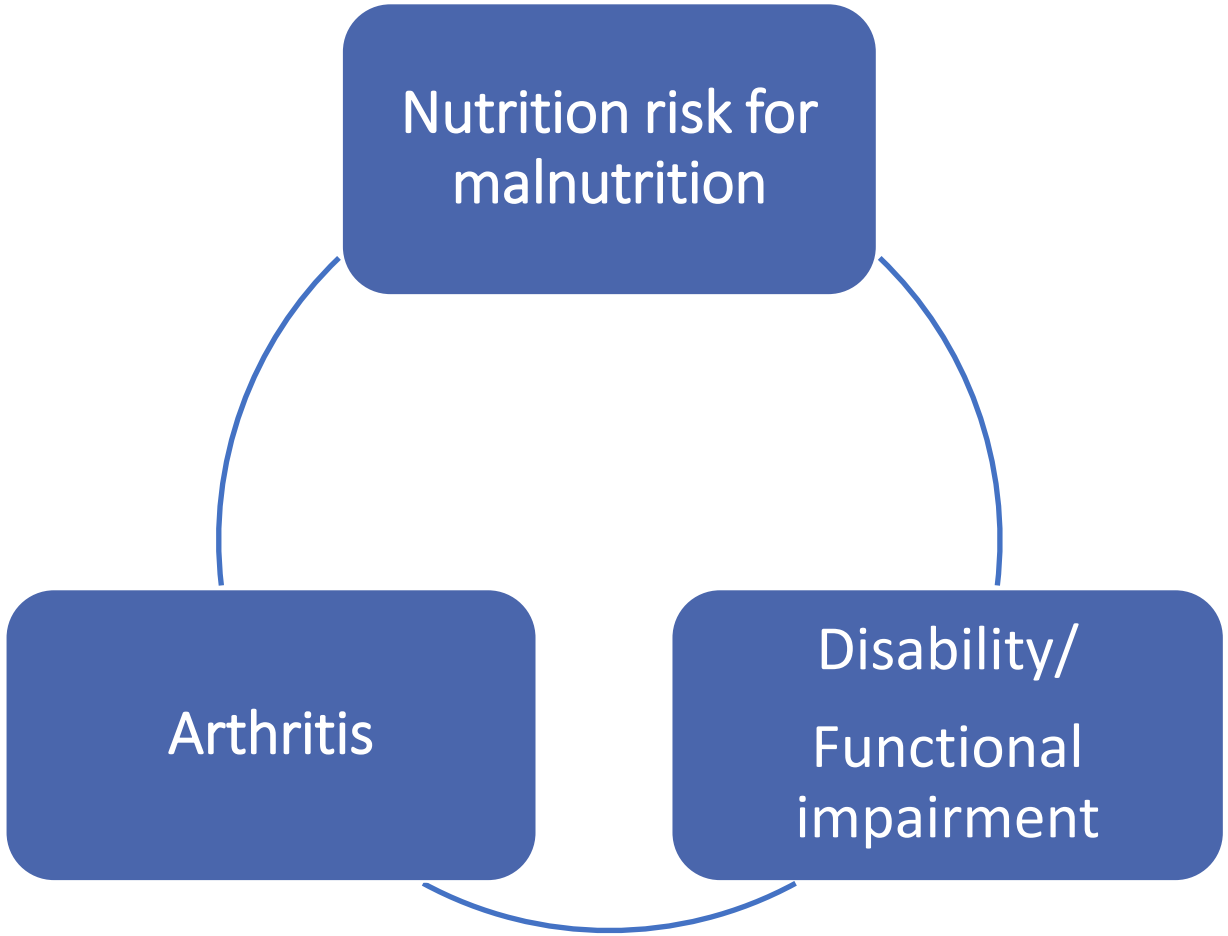
Statistics Canada, 2020; Shatenstein B, 2008

Osteoarthritis (OA) and Rheumatoid Arthritis (RA): A Comparison

Feature	Osteoarthritis (OA)	Rheumatoid Arthritis (RA)
Type of disease	Breakdown of cartilage & joint over time	Autoimmune
Onset	Usually later life (50+)	Any age (often 40–60)
Symptoms	Joints: pain, stiffness, reduced range of motion, instability	Joints: Pain or swelling in multiple joints, warmth, redness, stiffness Other: systemic symptoms (fatigue, fever, decreased appetite)
Canadian prevalence (adults 20+)	~15%	~1.2%

Arthritis Society Canada, 2021 and 2025; Public Health Agency of Canada, 2020.

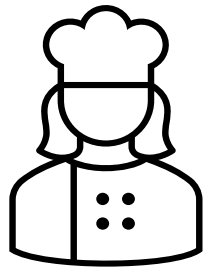
Linking Arthritis, Disability, and Nutrition: What Do We Know?



Katz PP et al. 2006; Bennett R et al. 2019; Ahlstrand I et al. 2015; Ramage-Morin PL et Garriguet D 2013; Theis KA et al. 2019; Tian, 2023

Linking Arthritis, Disability, and Nutrition: What Do We Know?

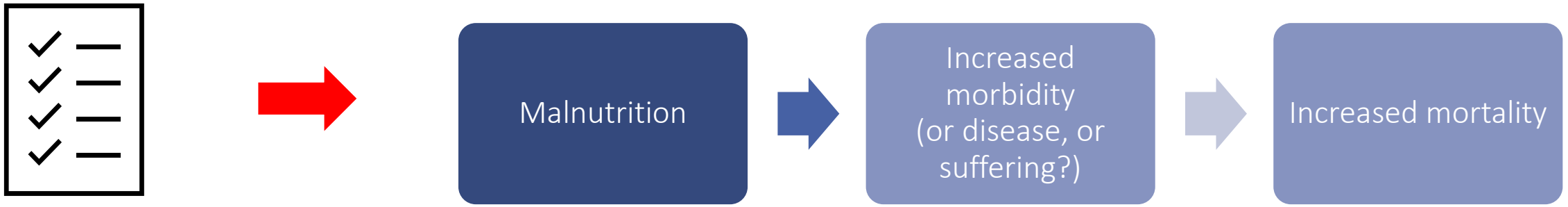
- ↓ Ability for activities of daily living (ADLs), ex: eating, bathing, etc.
- ↓ Ability for instrumental activities of daily living (IADLs), ex: food preparation, housekeeping, etc.
- Many contributing factors (pain, mental and physical health, etc.)



Katz PP et al. 2006; Bärebring L et al. 2018; Berube LT et al. 2017; Pereira Costa BA et al. 2016; Häkkinen A et al. 2006; Gikaro, 2022; Liu, 2024

Nutrition risk

SCREEN II



Seniors in the **C**ommunity: **R**isk **E**valuation for **E**ating and **N**utrition, Version II

Shatenstein B, 2008; Lee JS and Frongillo Jr. EA, 2001; Ramage-Morin PL and Garriguet D, 2013; Keller HH et al. 2005; Akhtar U et al. 2015

Study objectives

Describe the association between:

1. Arthritis and nutritional risk
2. Arthritis and nutritional risk while considering meal preparation impairment
3. Arthritis and nutritional risk while considering functional impairment

Data source

clsa élcv
Canadian Longitudinal Study on Aging
Étude longitudinale canadienne sur le vieillissement

"Tracking" group, n = 21,241

"Comprehensive" group, n = 30,097

Missing data/Excluded from analysis (n = 10,185)

Demographics
- total household income (n=3,321)
- number of people living in the household (n=23)
- education (n=2,421)

Measures
- self-rated general health (n=36)
- self-rated mental health (n=33)
- body mass index (BMI) (n=204)

Nutrition Risk or Functional Impairment
- any question within the nutritional risk or functional impairment questionnaires (n=4,147)

Final analytic sample: 41,153

Raina PS et al. 2009

Key measures – “Exposure”

- Arthritis (n = 14,468)
  - Osteoarthritis, OA (n=10,485)
  - Rheumatoid arthritis, RA (n=1510)
  - Other forms (n=4901)
  - "Comprehensive" group, Validated disease ascertainment or Likelihood of OA?
    - Affirmative response for symptoms of OA
    - Relationships between OA-related pain and nutrition assessed in sensitivity analyses

Fillenbaum GG and Smyer MA 1981; Oremus M et al. 2013; Keller HH 2012; CLSA 2017; Older Adult Nutrition Screening online

Key measures – "Outcome"

- Nutritional Risk Score
  - SCREEN II-AB, also known as SCREEN-8, 8-item tool

Factor	Score range
Recent weight changes	0-8
Frequency of meal skipping	0-8
General appetite	0-8
Difficulties with swallowing	0-8
Daily vegetable and fruit consumption	0-4
Daily fluid intake	0-4
Social context of mealtime	0-4
Frequency of cooking meals at home	0-4
TOTAL	**0-48**

Fillenbaum GG and Smyer MA 1981; Oremus M et al. 2013; Keller HH 2012; CLSA 2017; Older Adult Nutrition Screening online

Key measures

- Impairment
  - Older Americans' Resources and Services (OARS)
    - Activities of daily living (ADL): dressing, eating, appearance upkeep, walking, bathing, getting in and out of bed, using the bathroom
    - Instrumental activities of daily living (IADL): meal preparation, using the phone, travelling, shopping, housework, taking medication, financial management
  - Functional impairment (FI): Needed some help or unable to perform at least one ADL or IADL
    - Meal preparation impairment (MPI): Needed some help or unable to perform
    - FI for any activity (excluding meal preparation)

Fillenbaum GG and Smyer MA 1981; Oremus M et al. 2013; Keller HH 2012; CLSA 2017; Older Adult Nutrition Screening online

Analytical approach

- Nutritional risk scores (lower scores indicate higher risk): multiple linear regression
- Likelihood of high nutritional risk (SCREEN<38): logistic regression
- All analyses incorporated survey weights

	Model 1	Model 2	Model 3
Demographic characteristics (age, sex, race, household income, # people in household, education) **Measures of health** (Body mass index, self-rated general physical and mental health)	✓	✓	✓
Meal Preparation Impairment		✓	✓
General Functional Impairment (excl. meal prep impairment)			✓

Sample characteristics

Those with arthritis were more likely to:

- Be female
- Be older
- Different levels of educational attainment and income

	Arthritis (n=14,468)	No arthritis (n=26,685)	p
Male, %	41.6	53.7	<.0001
Age in years, Median (SD)	62.4 (0.1)	57.8 (0.06)	<.0001
White, %	96.6	95.7	<.0001
Income, %			
<20K/year	4.9	3	<.0001
20K-50K/year	24.3	16.8	
50K-100K/year	37.3	34.4	
100K+/year	33.6	45.8	
Highest education, %			
Less than secondary	5.2	3.6	<.0001
Secondary	20	17	
Trade school	34.7	32.7	
University or higher	40.1	46.6	

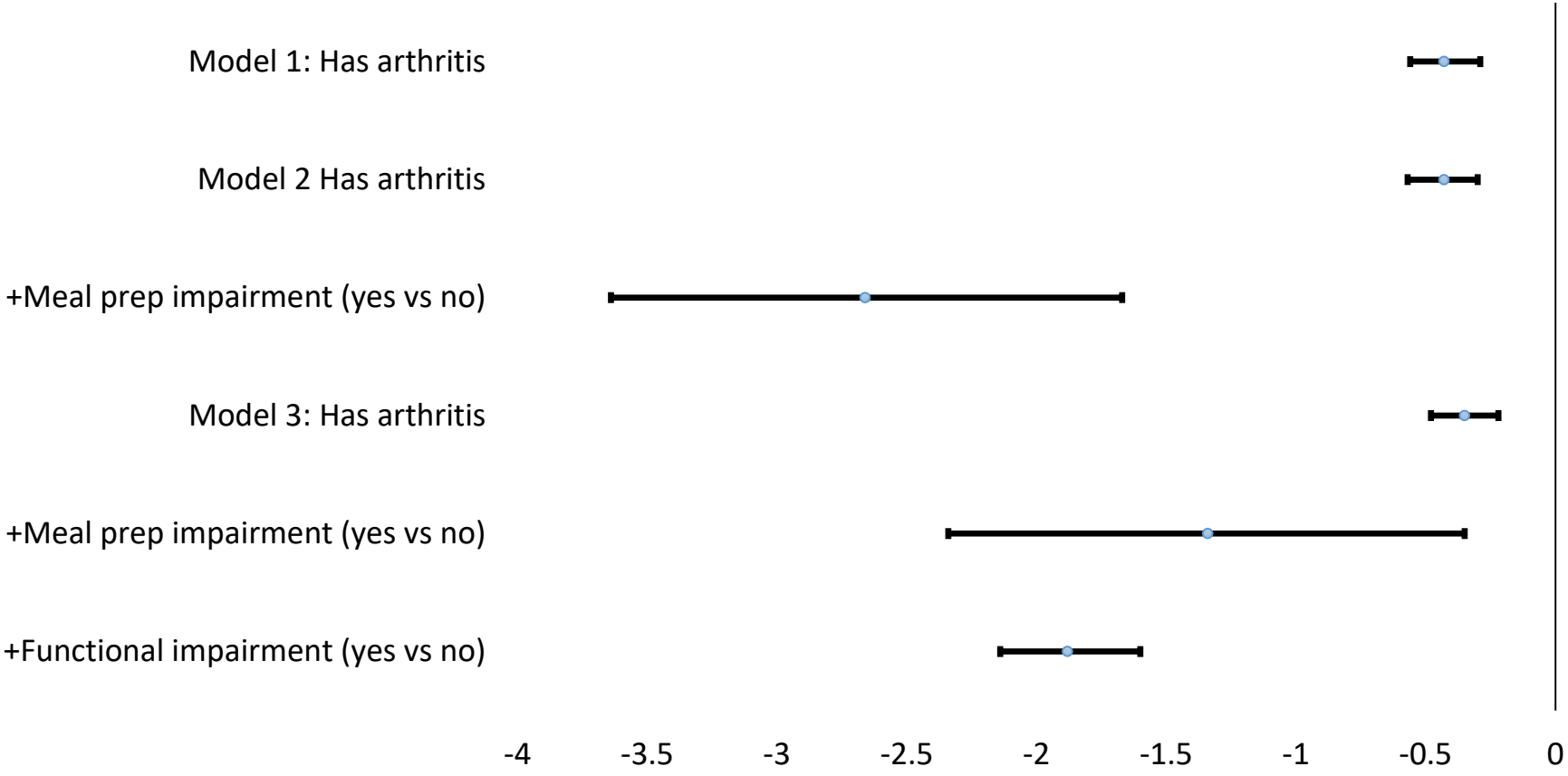
Sample characteristics

Those with arthritis were more likely to:

- Be at **high nutritional risk**
- Have greater levels of **general functional impairment, meal preparation impairment**
- Have obesity

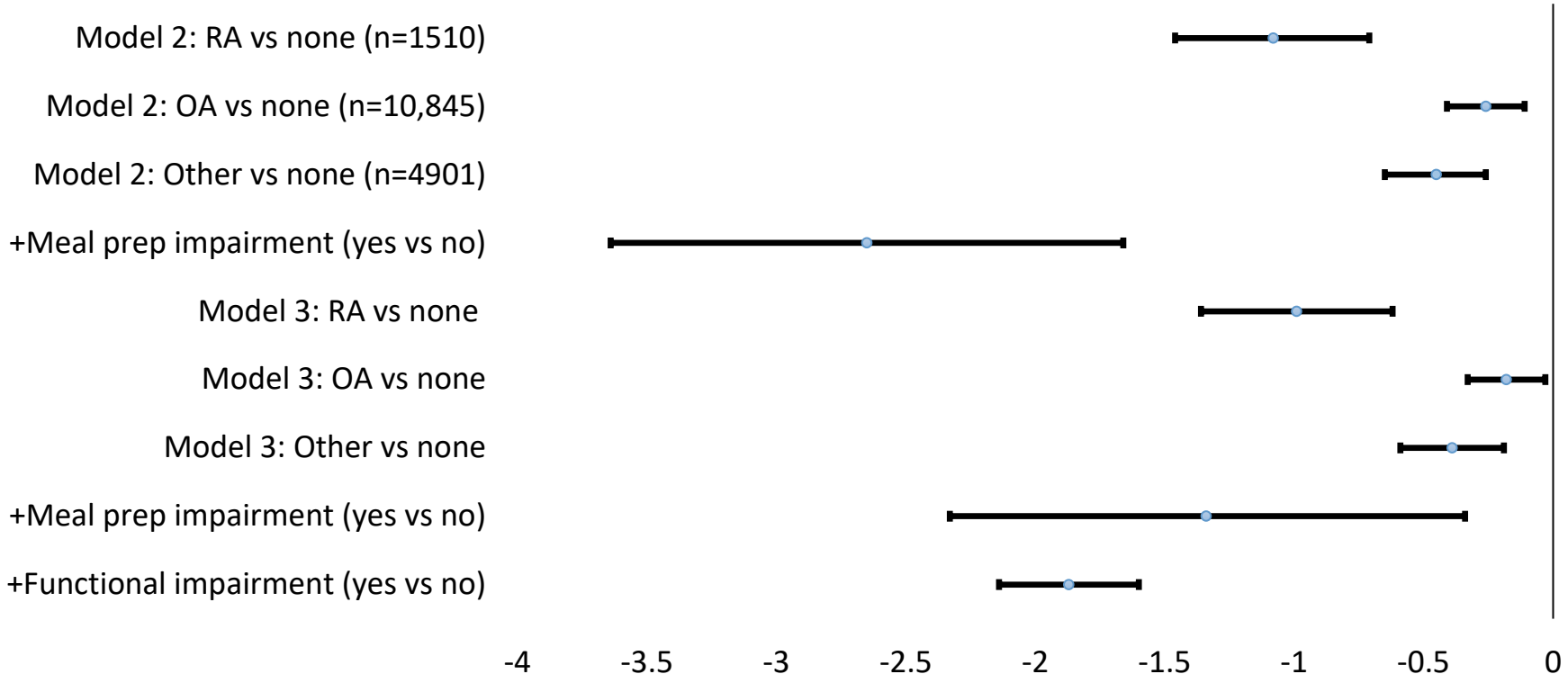
	Arthritis (n=14,468)	No arthritis (n=26,685)	p
Nutritional score (range: 0-48)	38.5 (0.08)	39.6 (0.05)	<.0001
High nutritional risk, %	37.9	31.2	<.0001
Any meal preparation impairment, %	0.7	0.3	<.0001
Any functional impairment (excl. meal preparation), %	13.1	4.8	<.0001
Number of functional impairments (excl. meal preparation), % (n=3,599)			
0	87	95.3	<.0001
1	12	4.4	
2	0.7	0.2	
3	0.2	0.07	
4	0.1	0.03	
Excellent or v. good physical health, %	53	67.4	<.0001
Excellent or v. good mental health, %	66.6	73.2	<.0001
Weight status, %			
Underweight	3.8	3.8	<.0001
Normal-weight or overweight	61.9	72.2	
Obese	34.3	23.9	

Nutritional risk score (linear regression)
Has arthritis



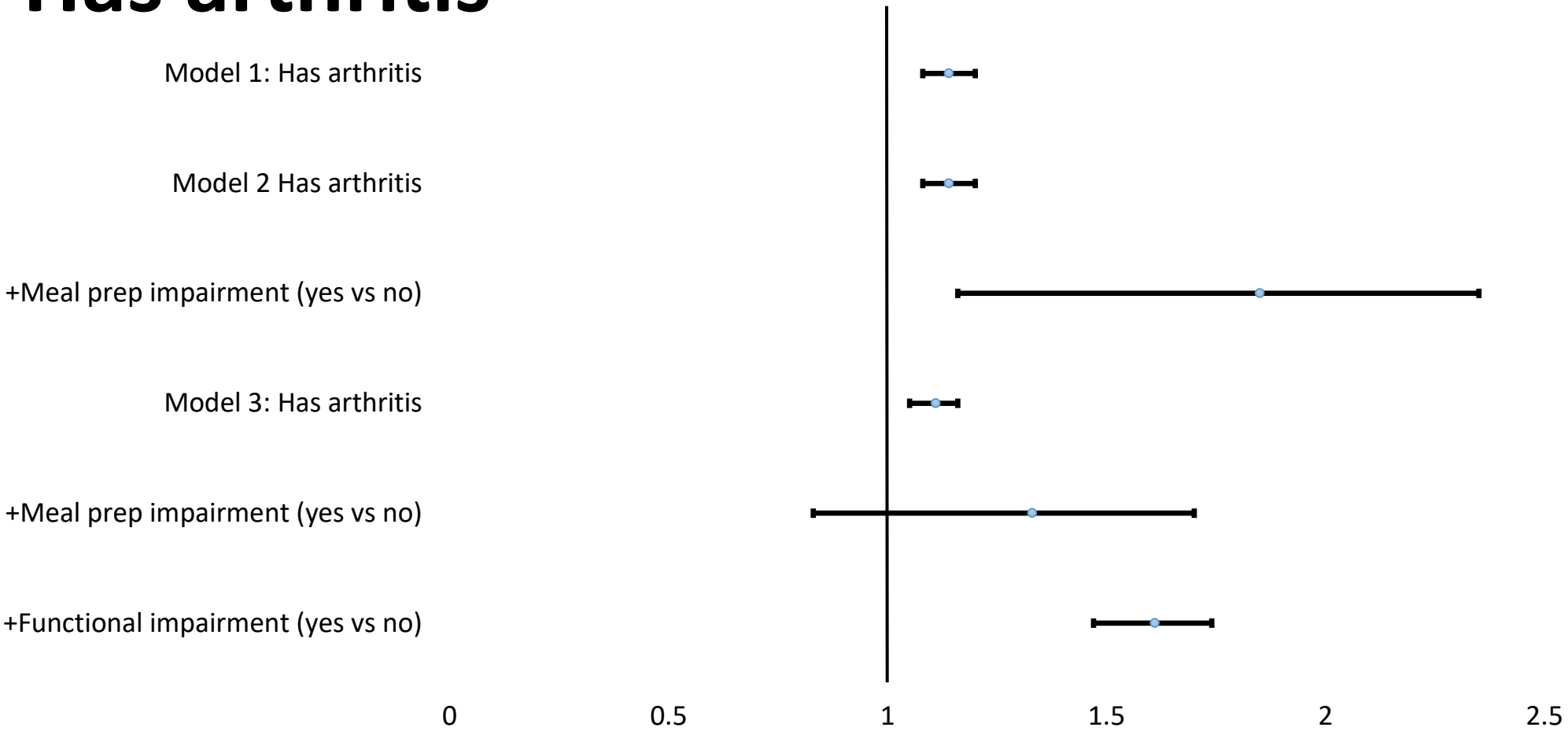
Adjusted for
-Demographic characteristics: age, sex, education, household income, race,
-Health measures: BMI category, self-rated general health, and self-rated mental health.

Nutritional risk score (linear regression)
Types of arthritis (vs none)



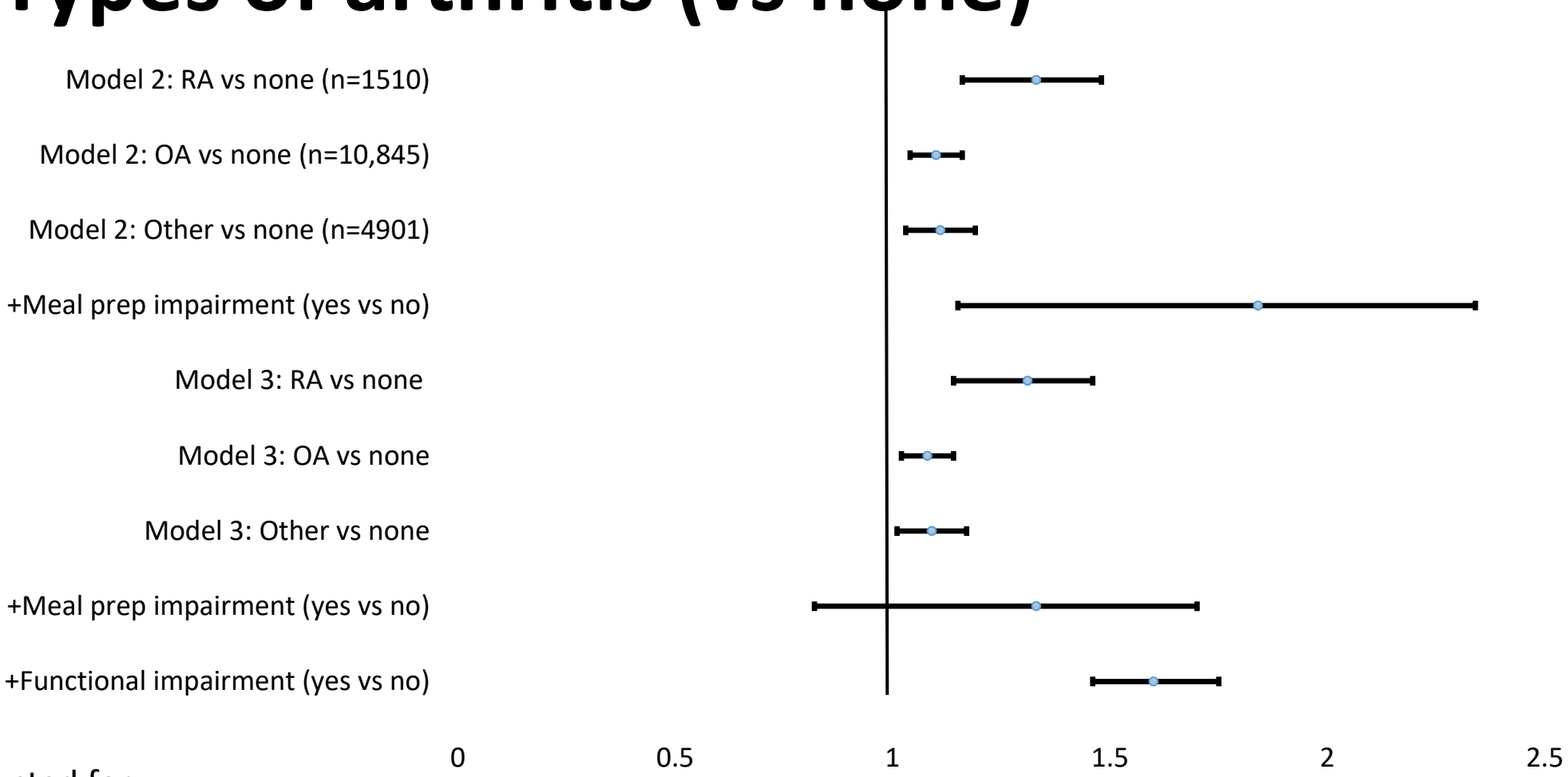
Adjusted for
-Demographic characteristics: age, sex, education, household income, race,
-Health measures: BMI category, self-rated general health, and self-rated mental health.

High nutritional risk (logistic regression) Has arthritis



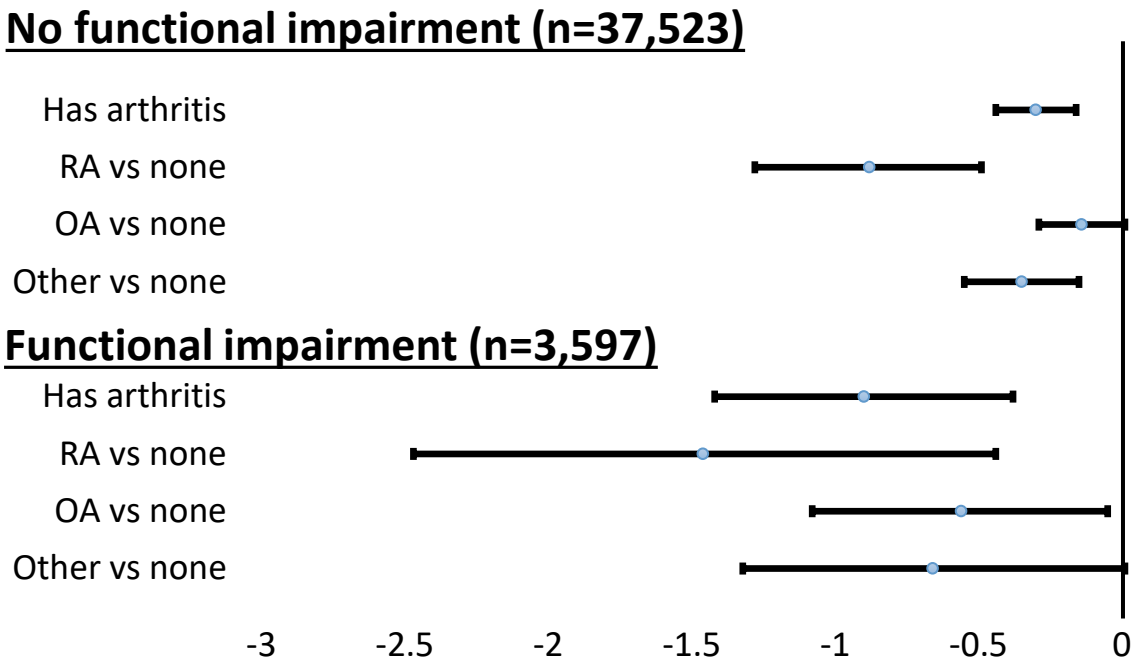
Adjusted for
-Demographic characteristics: age, sex, education, household income, race,
-Health measures: BMI category, self-rated general health, and self-rated mental health.

High nutritional risk (logistic regression)
Types of arthritis (vs none)

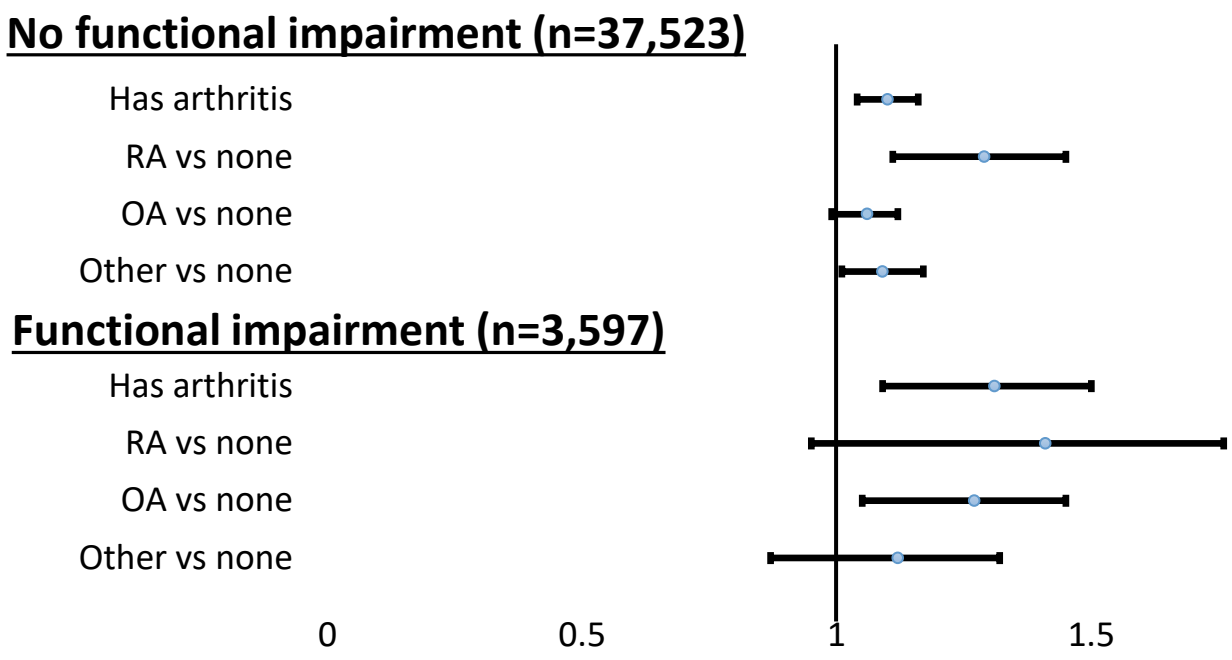


Adjusted for
-Demographic characteristics: age, sex, education, household income, race,
-Health measures: BMI category, self-rated general health, and self-rated mental health.

Nutritional risk score (B)



High nutritional risk (OR)



Adjusted for
-Demographic characteristics: age, sex, education, household income, race,
-Health measures: BMI category, self-rated general health, and self-rated mental health +meal preparation impairment

Discussion & Interpretation of findings

Large sample of older Canadian adults

- Examined respondents with any arthritis

Functional impairment

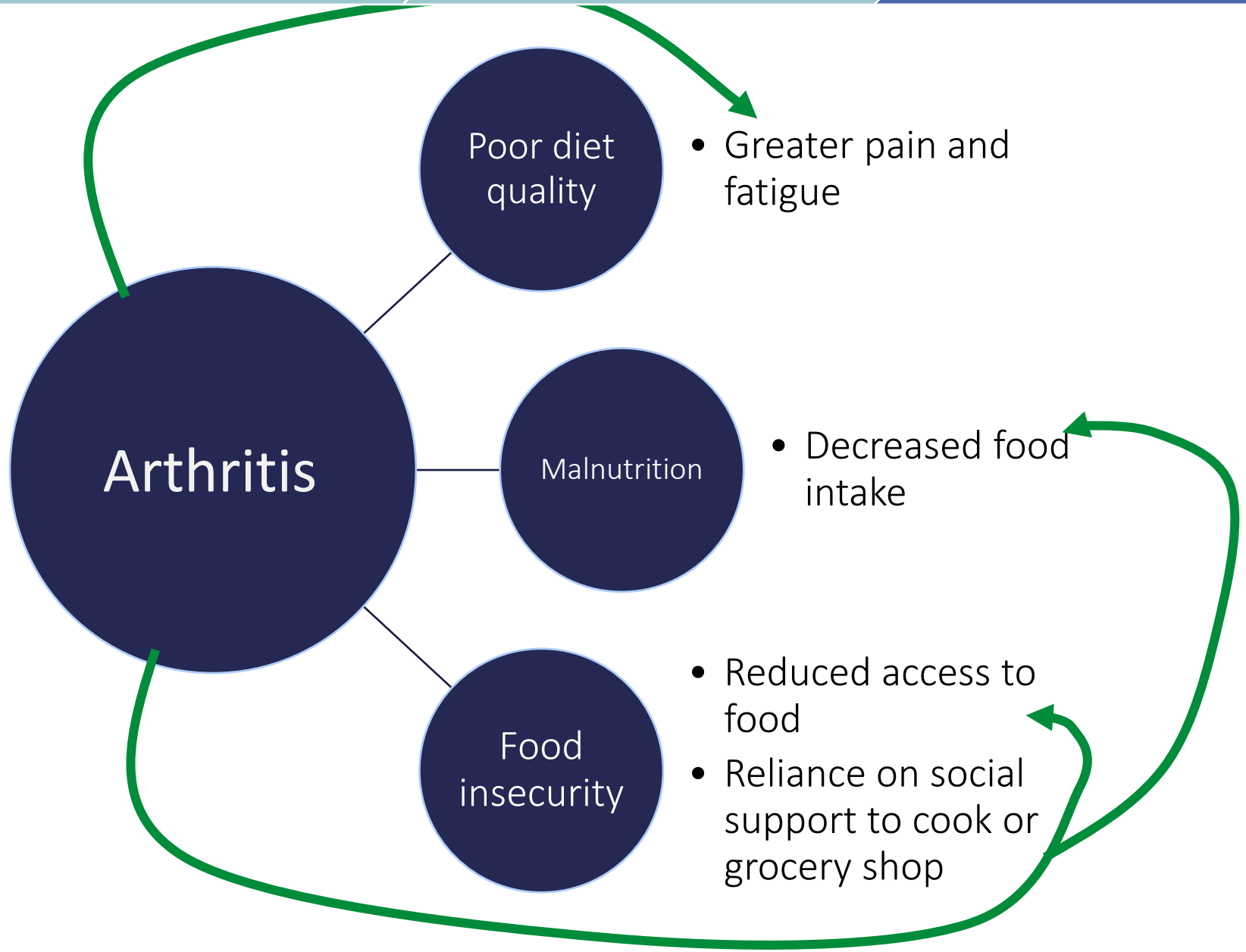
Nutrition risk scores

- Poorer for those with arthritis
  - Especially those with RA
- Also poorer for those with functional impairment

High nutrition risk

- Increased likelihood for those with arthritis
  - Especially those with RA
- Also more likely for those with functional impairment

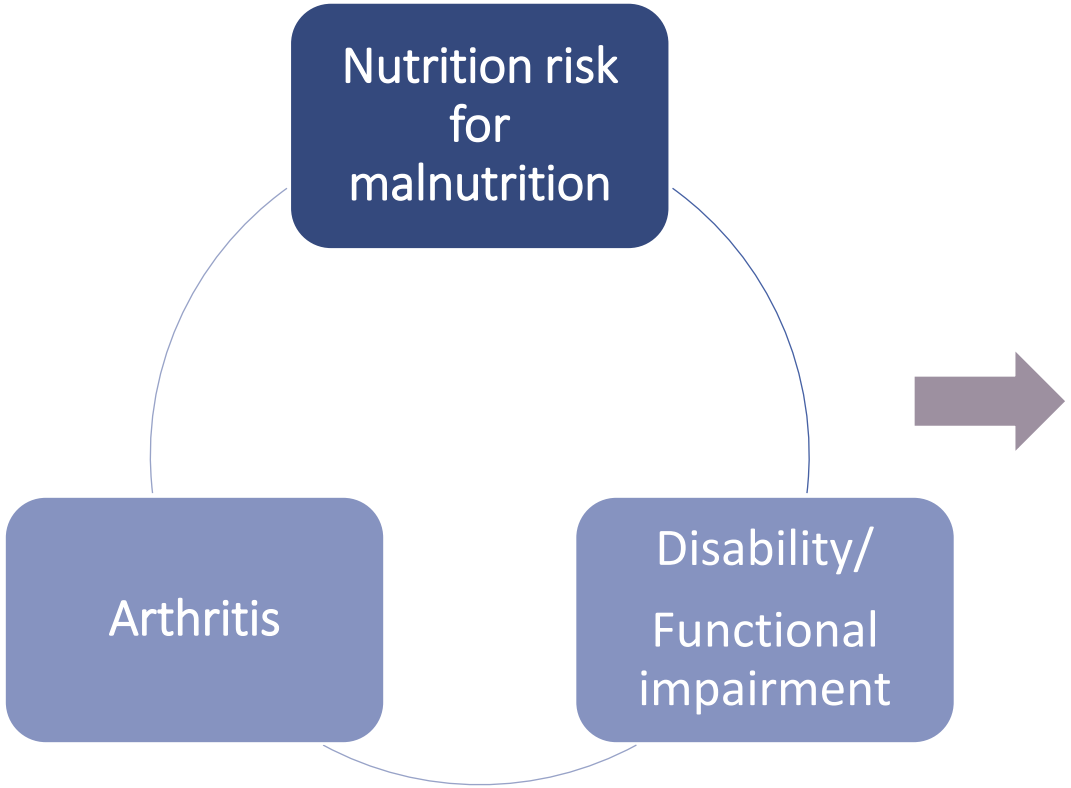
Discussion



Grimstvedt ME et al., 2010; Elkan AC et al, 2008 Druce KL and Basu N, 2019; dos Santos DL et al., 2019; Cai Q et al. 2023

Study contributions

- Large representative sample
- First study to investigate the association between arthritis and nutritional risk



Previous work : Ramage-Morin PL and Garriguet, 2013; Strobl R et al. 2013; Yap KB et al. 2007; Söderhamn U et al. 2012

Research Article

Identifying Barriers of Arthritis-Related Disability on Food Behaviors to Guide Nutrition Interventions

Roxanne Bennett, MSc(A)[1]; Thea A. Demmers, MSc, RD[2]; Hugues Plourde, PhD, RD[1]; Kim Arrey, BSc, RD[3]; Beth Armour, MEd, RD[4]; Guylaine Ferland, PhD[5]; Lisa Kakinami, PhD[2,6]

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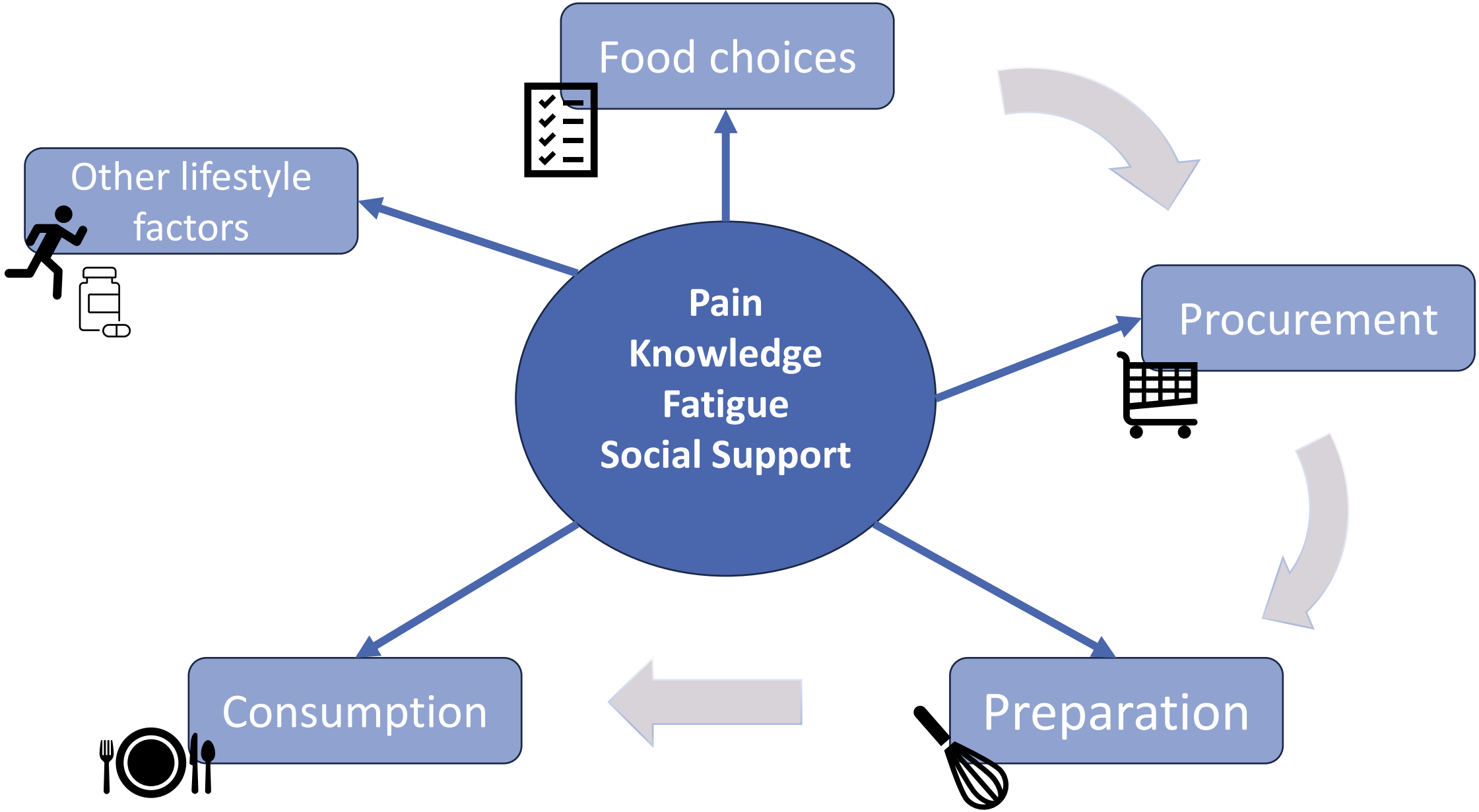
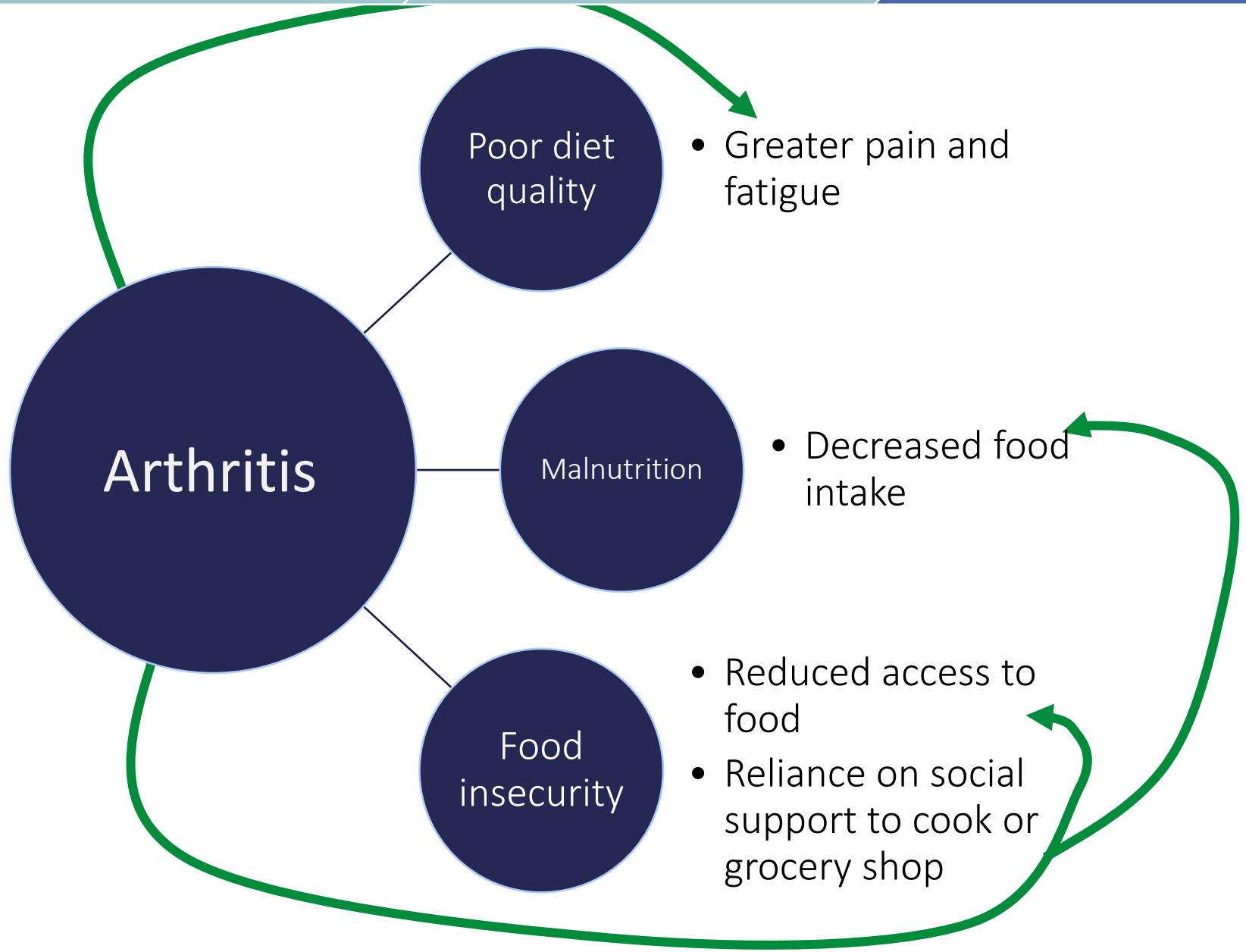

Food choices
Other lifestyle factors
Pain
Knowledge
Fatigue
Social Support
Procurement
Consumption
Preparation

Discussion



Grimstvedt ME et al., 2010; Elkan AC et al, 2008 Druce KL and Basu N, 2019; dos Santos DL et al., 2019; Cai Q et al. 2023

Study limitations

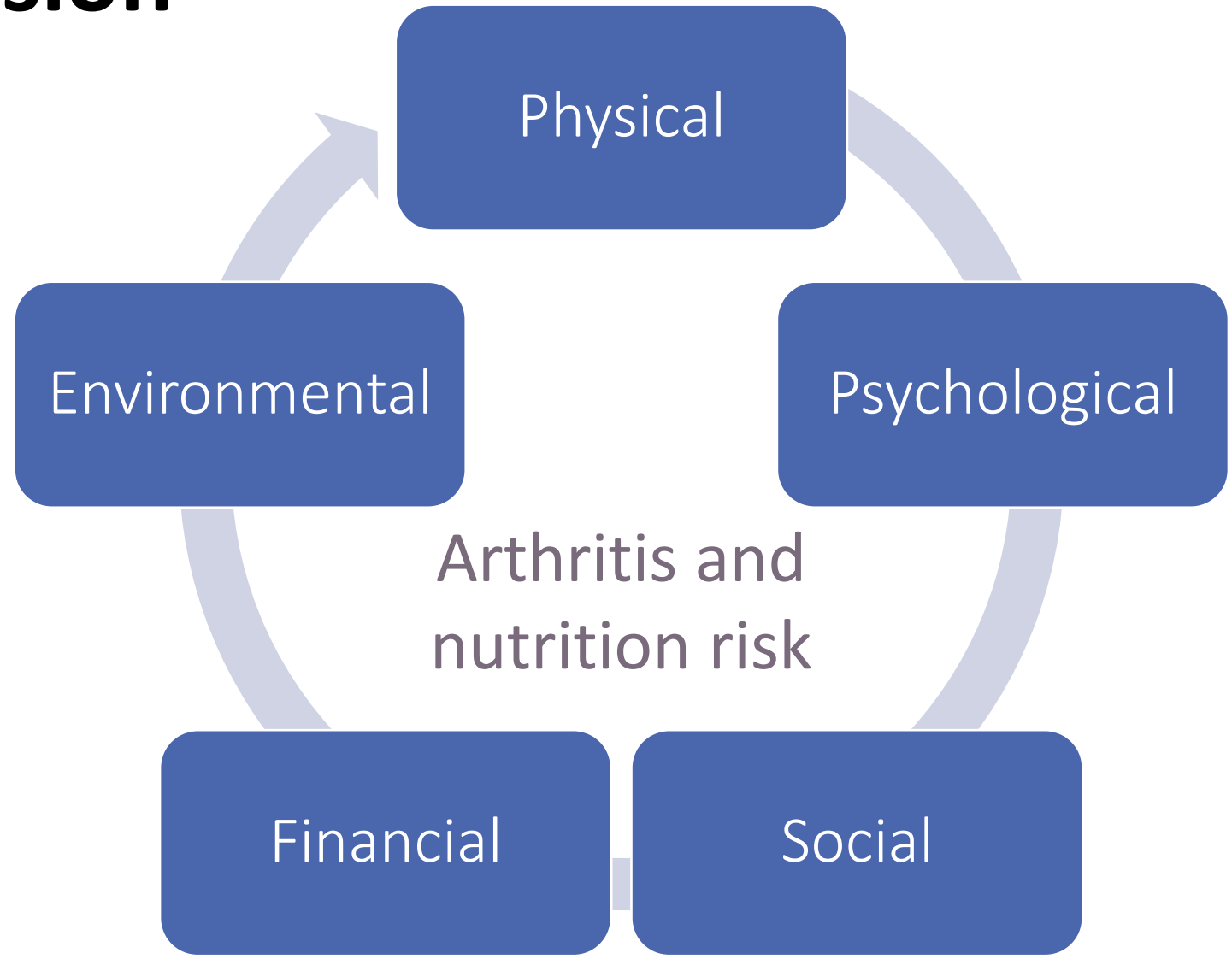
- Baseline data only
- Differences between included and excluded respondents in our analyses
- Self-reported data
- Older age amongst respondents with arthritis

Implications for practice and policy

- People living with arthritis could benefit from nutrition support.
- Health professionals should refer to dietitians/nutritionists.
- People living with arthritis could benefit from multidisciplinary support that addresses both nutrition risk and functional decline.
- Policies need to enhance access to these types of supports.

Shatenstein B, 2008; Ramage-Morin PL and Garriguet D, 2013; Topinková E, 2008

Conclusion


Physical
Psychological
Social
Financial
Environmental
Arthritis and nutrition risk

Thank you!

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