The Association Between Whole Grain Intake and Osteoarthritis Odds in Women Over the Age of 65 Using Data from NHANES 2017 to Pandemic 2020

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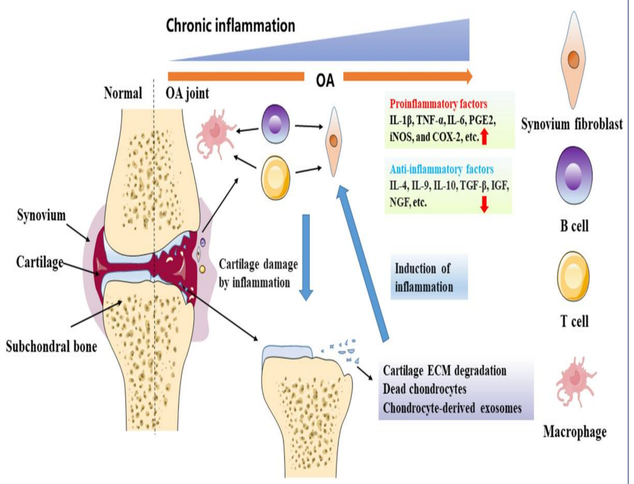
Introduction

- Osteoarthritis (OA) is the most common form of arthritis in the United States, **predominantly impacting older women**.
- **Figure 1** below demonstrates the pathophysiology of osteoarthritis.



- While various dietary anti-inflammatory dietary approaches have been investigated to manage osteoarthritis symptoms, there is limited research on the impact of whole grain intake. Their **anti-inflammatory components such as fiber, vitamins, and phytochemicals**, may be beneficial in preventing the chronic inflammation associated with osteoarthritis.
- The **objective** of this study is to examine the association between whole grain consumption and osteoarthritis in women over the age of 65.

Methods

- This study used cross-sectional NHANES 2017 to March 2020 pre-pandemic data to evaluate osteoarthritis prevalence and whole grain intake in women over the age of 65.
- Participants were excluded if they were male, under the age of 65, had rheumatoid or psoriatic arthritis, or were missing dietary data. The final dataset included 640 participants.
- Whole grain intake was measured as a continuous variable in ounces. Osteoarthritis was measured as a two-level categorical variable via the participants response to the osteoarthritis question in NHANES.
- Logistic Regression was used to examine the association of the variables.
- Results were reported using odds ratios (ORs) with 95% confidence intervals (CIs). Statistical significance was recognized as $p < 0.05$ (Table 3).

Results

Table 2. *Population Characteristics of Women Over 65 in NHANES 2017 to Pre-pandemic 2020*

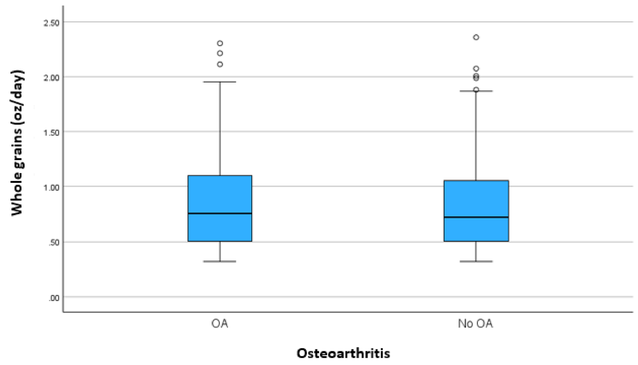
Category	Variables	N	No OA	N	OA	p-value
Demographics	Age *(years)*	324	72.4 ± 5.4	316	73.7 ± 5.2	0.003**
	Education level	324		315		
	<9th grade		9.6%		5.7%	
	9th to 11th grade		11.4%		9.5%	
	High school /GED		24.7%		28.8%	0.171***
	Some college/associate's		29.0%		33.9%	
	College graduate or higher		25.3%		21.8%	
	Body Mass Index *(BMI = kg/m²)*	314	29.1 ± 7.2	307	31.0 ± 7.2	0.001**
Lifestyle	Total MET *(Minutes)*	206	32.6 ± 34.2	180	28.6 ± 20.0	0.155**
	Depression score	302		300		
	None		74.5%		68.0%	
	Mild		18.9%		21.0%	
	Moderate		4.6%		7.7%	0.304***
	Moderate-severe		1.7%		2.3%	
	Severe		0.33%		1.0%	
	Sleep health	322		313		
	Short sleep duration		22.7%		19.2%	
	Inconsistent sleep		16.8%		14.7%	
	Poor sleep quality		16.5%		28.2%	0.006***
	Healthy sleep		44.1%		38.0%	
	Cigarette use	107	23.4%	113	23.0%	0.598***
Diet	Total energy intake *(kcals)*	324	1707.1 ± 326.4	316	1765.2 ± 328.7	0.025**
	Whole grain intake *(oz/day)*	324	0.817 ± 0.383	316	0.843 ± 0.393	0.389**
	Alcohol consumption *(grams/day)*	324	5.5 ± 6.4	316	6.3 ± 8.3	0.161**

Table 2. **n (%), or mean ± SD, or median (IQR), **p-value determined using t-test, ***p-value determined using Chi-squared test, ****underlined values indicate statistical significance ($p < 0.05$)*

Table 3. *Logistic Regression Models 1-5 Predicting OA*

Logistic Regression Models 1-5 Predicting OA Status				
Model	**Variable**	**Odds Ratio**	**95% CI**	**p-value**
Model 1 (OA = Whole grain intake)	Whole grain intake	0.838	[0.562, 1.252]	0.388
Model 2: Demographics Covariates (OA = Whole grain intake + age + education level + BMI)	Whole grain intake	0.769	[0.769, 0.504]	0.222
Model 3: Lifestyle Covariates (OA = Whole grain intake + total MET + depression + sleep health + cigarette use)	Whole grain intake	1.708	[0.540, 5.395]	0.362
Model 4: Dietary Covariates (OA = Whole grain intake + total energy intake + alcohol consumption)	Whole grain intake	0.887	[0.586, 1.341]	0.569
Model 5: All Covariates (Models 1-4)	Whole grain intake	4.428	[1.003, 19.552]	0.050

Figure 2. *Distribution of Whole Grain Intake by Osteoarthritis Status in Women Aged 65+"*



Conclusions

- Overall, the findings from this study do not provide strong evidence that whole grain intake is significantly associated with OA risk in women over the age of 65.
- While Model 5 did suggest a potential increased risk with higher whole grain intake, the wide confidence interval and borderline significance ($p = 0.050$) indicates that this result should be interpreted with caution.
- A limitation of this study is it's cross-sectional, so a causal relationship cannot be established.
- Further research is needed to explore the potential confounding factors, and underlying mechanisms at play that may influence the association between whole grain intake and osteoarthritis.

References

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