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β, estimate; SE, standard error. aAdjusted for age, sex, education, employment status, body mass index, affected knee with knee osteoarthritis, and knee osteoarthritis severity.

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ASSOCIATION OF ULTRA-PROCESSED FOOD INTAKE AND SEX DIFFERENCES IN OSTEOARTHRITIS-RELATED PAIN AND CLINICAL PERFORMANCE

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Purpose (the aim of the study): The role of diet in human health has long been recognized as an important modifiable lifestyle factor. Ultra-processed foods (UPF) are foods that are industrially processed for increased shelf-life and palatability. While diets like the Mediterranean have been associated with decreased morbidity from knee osteoarthritis (KOA)—a condition that disproportionately affects women—the relationship between UPF and KOA in different sexes has yet to be determined. This study thus aims to investigate associations between UPF content in the diet and KOA-related patient reported outcomes.

Methods: This cross-sectional study included all eligible participants at enrollment (4796 participants, 9592 knees) from the Osteoarthritis Initiative (OAI), which included men and women with or at risk for symptomatic or radiographic KOA. Participants with rheumatoid arthritis (n=66) or unplausible Food Frequency Questionnaire (FFQ) answers were excluded (n=400).

Dietary content was assessed by Block Brief 2000 FFQ administered at enrollment. It consists of 102 food- and beverage-related questions, with images and questions about consumption. UPF consumption was calculated as per NOVA diet classification, which groups dietary ingredients into 4 classes based on processing level, with NOVA-4 being the highest. The primary predictor was daily UPF servings ratio (%)—the proportion of NOVA-4 items in the overall diet (**Fig. 1A**).

The primary outcome measure was Western Ontario and McMaster University OA Index (WOMAC) pain. Secondary outcomes included WOMAC Activities of Daily Living (ADL), Stiffness, and Total scores and Chair Stand Test (CST), defined as the number of repeated stands per second.

Descriptive statistics were reported as counts (%) and mean(±SD). The relationships between UPF and WOMAC scores and CST were assessed by mixed effects regression models, accounting for two knees/individual, and multiple linear regression models, respectively. Beta coefficients represent the change in respective outcome for each 1% increase in UPF ratio (servings/day). An interaction between UPF and sex was added to test whether the associations between UPF consumption and WOMAC scores differed by sex. Sex-stratified results are presented after observing statistically significant results for interaction analysis. Significance was set at $p < 0.05$. All models were adjusted for age, BMI, caloric intake, race, Physical Activity Score of Elderly (PASE), depression, and insurance status.

Results: There were 4330 participants (1817[42%] men) with a mean age of 60.95 (±9.53) years. Daily UPF ratio in overall diet was lower in women than men (b=-0.016 [-0.018, -0.014], $p < 0.001$) (**Fig. 1B**). Interaction of UPF consumption and sex on pain scores revealed significant variation between men and women (p=0.02) (**Fig. 1C**), which led to further inquiry for sex-stratified results.

There were significant associations between UPF ratio and WOMAC pain (b=4.14 [1.11, 7.17], p=0.007), ADL (b=16.78 [6.19, 27.39], p=0.002), and total (b=20.38 [5.90, 34.86], p=0.006) scores for women but no significant WOMAC associations in men (**Table**). Results for CST showed significantly diminished physical performance in women (β=-0.28 [-0.44, -0.12], $p < 0.001$).

Conclusions: Despite consuming lower amounts of UPF than men, women in this cohort suffer more from KOA-related pain and show more diminished physical performance. These results suggest that irrespective of BMI, dietary content, particularly high proportions of UPF, can have a deleterious effect on knee joint health in women and could also be important in explaining their predilection for more severe KOA.

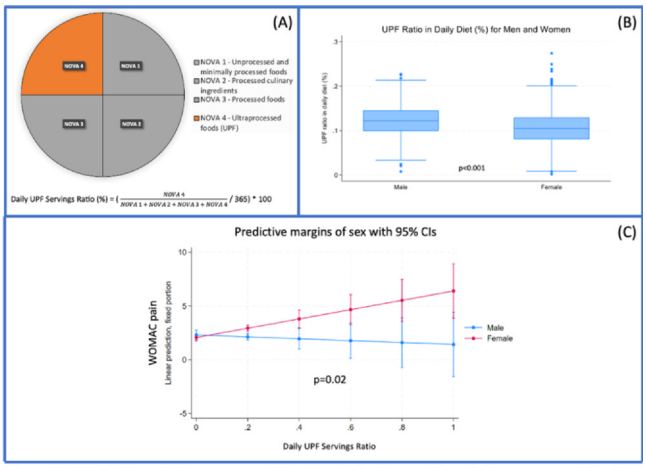

Figure 1A. Calculation of ultra-processed food predictor (proportion of ultra-processed food in the overall annual diet) based on the serving sizes and consumption frequency data from the Block Brief 2000 Food Frequency Questionnaire. **1B.** Boxplot representing the UPF ratio in participants of different sex. **1C.** Interaction plot from mixed effects models, between UPF ratio and WOMAC pain scores, adjusted for age, race, body mass index, PASE scores, total daily caloric intake, depression, and medical insurance status (p-value=0.02).

Table. Associations between UPF ratio and clinical outcome measures (WOMAC Scores and Chair Stand Test) Stratified by Sex. Beta coefficients represent the change in respective outcome measure for each 1% increase in UPF ratio in daily diet.
Data represents results from models adjusted for age, BMI, total daily caloric intake, PASE, depression, and medical insurance status. ADL: Activities of Daily Living. PASE: Physical Activity Score of Elderly. Bold numbers indicate statistically significant results.

Outcome Measures		Women (n=2513; 5026 knees)		Men (n=1817; 3634 knees)	
		β (95%CI)	p-value	β (95%CI)	p-value
WOMAC Domains	Pain	4.14 (1.11, 7.17)	**0.007**	-0.59 (-3.74, 2.57)	0.716
	ADL	16.78 (6.19, 27.39)	**0.002**	3.00 (-7.75, 13.75)	0.584
	Stiffness	1.11 (-0.45, 2.67)	0.164	0.79 (-0.93, 2.51)	0.365
	Total	20.38 (5.90, 34.86)	**0.006**	3.20 (-11.60, 17.99)	0.672
Chair Stand Test (stands/sec)		-0.28 (-0.44, -0.12)	**<0.001**	-0.18 (-0.38, 0.02)	0.079

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FEASIBILITY OF A LIVE-VIDEO MIND-BODY PROGRAM FOR THOSE WITH COMORBID KNEE OSTEOARTHRITIS, OBESITY, AND DEPRESSIVE SYMPTOMS

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Purpose (the aim of the study): Comorbid obesity and depression are common and affects 13% of those with knee osteoarthritis (OA), equating to an estimated 2.2 million Americans. Co-occurring obesity and depression 1) may be associated with worse pain, 2) may accelerate the progression to end-stage OA, and 3) predisposes patients with end-stage OA to inferior surgical outcomes. In light of these risks, we developed the GetHealthy-OA program specifically for adults with comorbid knee OA, obesity, and depressive symptoms. The purpose of this pilot randomized controlled trial (RCT) was to evaluate the feasibility and acceptability of the GetHealthy-OA program, which was developed to improve pain, function, and physical activity for the high-risk group with comorbid knee OA, obesity, and depressive symptoms.

Methods: Participants with knee OA, obesity (BMI ≥ 30 kg/m^2), and depressive symptoms (PHQ-9 ≥ 10) were enrolled from an academic medical center's orthopaedic clinics. Participants completed baseline and post-treatment assessments consisting of patient-reported outcome