

Abstracts of the WCMSR

01. DIETARY CREATINE INTAKE AND DEPRESSION IN U.S. ADULTS: A MULTI-CYCLE NHANES REPLICATION AND SENSITIVITY ANALYSIS OF BAKIAN 2020

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BACKGROUND: Higher dietary creatine intake may protect against depression. Bakian et al. (2020, Translational Psychiatry) found an adjusted odds ratio (AOR) of 0.68 (95% CI 0.52–0.88) for current depression in the top versus bottom quartile of intake among 22,692 NHANES adults (2005–2012), with stronger effects in women and in those aged 20–39 years. Replication in newer NHANES cycles is scarce, and no study has yet asked whether the result holds when the dietary creatine source is defined differently.

AIM: We aimed to repeat Bakian's analysis in a more recent pre-pandemic NHANES cohort (2013 to March 2020) and to see whether the result survives four alternative definitions of dietary creatine.

METHODS: We pooled adults aged 20 years or older with a valid PHQ-9 and at least one 24-hour dietary recall from NHANES 2013–2014, 2015–2016, and 2017–March 2020. Current depression was defined as PHQ-9 $\geq$ 10. Daily creatine intake was estimated from animal-protein equivalents in the USDA Food Patterns Equivalents Database (FPED, accessed via the R package `heiscore.data`) using Bakian's 3.88 mg/g coefficient. We tested four definitions of the creatine source. Definition A used PF_MPE only (meat, poultry, eggs; no seafood). Definition B added 30% of PF_SSNS, the version closest to Bakian's. Definition C combined PF_MPE with (PFSEAPLANTLEG – PF_LEGUMES), pulling in seafood and non-legume plants. Definition D added 50% of PF_SSNS as a high-seafood scenario. Survey weights were combined across cycles per U.S. National Center for Health Statistics (NCHS) guidance. Survey-weighted logistic regression (R survey package) adjusted for age, sex, race/ethnicity, income, education, BMI, smoking, physical activity, healthcare access, antidepressant or anxiolytic use, and cycle.

RESULTS: The final sample was 14,664 adults. The AOR for current depression in Q4 versus Q1 of dietary creatine was 0.72 (95% CI 0.54–0.95) under definition B, 0.65 (0.46–0.91) under definition C, 0.67 (0.50–0.91) under definition D, and 0.81 (0.60–1.07) under definition A, which excluded seafood. Continuous models per 0.1 g/day gave an AOR of 0.96 (0.93–1.00, $P = 0.043$) under B, with similar estimates under C and D ($P = 0.014$ and $P = 0.027$). The 20–39-year subgroup ($n = 4,607$) gave AORs between 0.60 and 0.72, mirroring Bakian, but their confidence intervals crossed 1, so this subgroup was underpowered.

CONCLUSION: In our pre-pandemic NHANES cohort, higher dietary creatine intake was tied to lower odds of current depression whenever seafood was counted in the source (definitions B, C, D), and not when only meat, poultry, and eggs were used (definition A). Under the version closest to Bakian's, the AOR was 0.72 against 0.68 in her original report — a bit weaker, same direction. The 20–39-year subgroup pointed the same way but was too small to reach significance. The creatine-depression link replicates in newer NHANES data, but its size depends on whether seafood enters the calculation. Future studies should make that choice explicit.

Key Words: Creatine; Depression; Nutrition Surveys; Reproducibility of Results; Diet Surveys.

Table 1. Adjusted odds ratios (Q4 versus Q1) for current depression across four definitions of the dietary creatine source, NHANES 2013–March 2020 (N=14,664).

Definition	AOR Q4 vs Q1	95% CI	Continuous AOR per 0.1 g/d (95% CI)	P (continuous)
A — PF_MPE only (meat/poultry/eggs; excludes seafood)	0.81	0.60–1.07	0.97 (0.94–1.01)	0.113
B — PF_MPE + 0.30 × PF_SSNS (closest to Bakian)	0.72	0.54–0.95	0.96 (0.93–1.00)	0.043
C — PF_MPE + seafood and plant proteins	0.65	0.46–0.91	0.96 (0.93–0.99)	0.014
D — PF_MPE + 0.50 × PF_SSNS (high-seafood scenario)	0.67	0.50–0.91	0.96 (0.92–0.99)	0.027

AOR: adjusted odds ratio (survey-weighted logistic regression). Models adjusted for age, sex, race/ethnicity, income, education, BMI, smoking, physical activity, healthcare access, antidepressant 3 or anxiolytic use, and NHANES cycle. n = 4,607 in the 20–39 stratum (subgroup AORs not shown; 4 CIs crossed unity for all four definitions).