University of South Carolina

NUTRITION CONSORTIUM
ARNOLD SCHOOL OF PUBLIC HEALTH
11TH ANNUAL NUTRITION MINI-SYMPOSIUM
NUTRITION RESEARCH DAY: SHARE, DISCOVER, CONNECT
VIRTUAL CONFERENCE
APRIL 9, 2021

1:00-2:00PM Friday, April 9, 2021

Creating Connections: Leveraging Diverse Training Experiences to Create Research Opportunities*

1:00-1:05PM **Welcome**

Christine Blake, PhD, RD

1:05-1:10PM **Introduction of the Keynote**

Moderator: Brie Turner-McGrievy, PhD, RD

1:10-1:40PM **Keynote Presentation**

Carolina Dunn, PhD, RD

1:40-2:00PM **Facilitated Discussion**

*Disclaimer: The information in this presentation is solely the opinion and responsibility of the author and does not represent her employer.

2:00-2:15PM Friday, April 9, 2021

Exercise Break with the Student Nutrition Group

Nkechi Okpara, Doctoral student

2:15-3:35PM Friday, April 9, 2021

Doctoral Dissertation Presentations

2:15-2:20PM **Introduction**

Moderator: Leila Larson, PhD

Presentations

2:20-2:34PM Tushar Trivedi, PhD

Intracranial Atherosclerotic Stenosis and its Association with Inflammation and Mediterranean Diet

2:35-2:49PM Malcolm Bevel, PhD

To Plant or Not to Plant: A Mixed Methods Analysis of the Role of Food Swamps and Deserts on Inflammation and Community Gardening Among African American Women in South Carolina

2:50-3:04PM Ligia Reyes, PhD

Characterizing the Local Food Environment to Understand Maternal Food Acquisition for Young Children in Rural Mexico

3:05-3:19PM Shilpa Constantinides, PhD

The Role of Stakeholder Framing in Nutrition Agenda-Setting to Address the Double Burden of Malnutrition in Tamil Nadu, India

3:20-3:35PM Elyse Iruhiriye, PhD

Understanding the Role of Political Commitment and Nutrition Policy Coherence in Enabling Improvements in Nutrition in Rwanda

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3:35-3:50PM Friday, April 9, 2021
Poster Presentation Awards
Closing Remarks
Christine Blake, PhD, RD

ORAL ABSTRACTS

Tushar Trivedi, PhD, Department of Epidemiology and Biostatistics

Intracranial Atherosclerotic Stenosis and its Association with Inflammation and Mediterranean Diet

Objective: Intracranial Atherosclerotic Stenosis (ICAS) is associated with 8 to 10% of all strokes in the U.S. Although there is some evidence that in the Asian population inflammation plays a role in asymptomatic ICAS, it has not been shown in the U.S. population. Prior studies have shown associations between diet and regulation of inflammation. Mediterranean dietary pattern has been associated with lower levels of inflammation and cardiovascular disease (CVD). In light of the important role of inflammation in intermediate stroke risk factors including atherosclerotic disease, and potential role of diet in modulating inflammation, understanding individuals' diets according to their inflammatory properties could yield important information about the links between diet, inflammation, and ischemic stroke. Our objectives for this study were two-fold. First, we assessed if high sensitivity C-reactive protein (hs-CRP), a marker of inflammation is associated with asymptomatic ICAS. Second, we assessed if Mediterranean dietary adherence is associated with ICAS, and if this association is modified with individual's inflammatory state.

Methods: Data came from the Atherosclerosis Risk in Communities Cohort, a community-based, prospective cohort total of 15,792 participants, aged 45 to 64 years recruited in1987 to 1989. We included 1,445 participants from this cohort who attended Visit 5 (2011-2013) and underwent high resolution MR angiography (MRA). MRA images were analyzed in a centralized lab to assess ICAS (outcome) and ICAS was graded as: no stenosis, <50% stenosis, ≥50% stenosis/complete occlusion. Change in hs-CRP exposure) was categorized as sustained low/moderate (<3 mg/L at visits 2 and 4); decreased (≥3 mg/L at visit 2 and <3 mg/L at visit 4); increased (<3 mg/L at visit 2 and ≥3 mg/L at visit 4); and sustained elevated (≥3 mg/L at both visits). Multinomial logistic regression models were used to assess the association of 6-year change in hs-CRP with ICAS at visit 5. We also tested for the association between hs-CRP levels at each visit (categorized as <1, 1-3 and >3 mg/l) and ICAS. Further to assess Mediterranean dietary adherence we constructed an adapted Mediterranean Dietary Score (aMDS), that included the following 11 food components: non-refined cereals (whole grains), fruits, vegetables (excluding potatoes), nuts, legumes, fish, monounsaturated-to-saturated fat ratio (as an alternative for olive oil), red and processed meats, dairy products, poultry and alcohol. The aMDS ranged from 0 to 55, with higher values indicating greater adherence to the Mediterranean diet. Multinomial logistic regression models were used to assess the association between the Tertiles of the aMDS and ICAS.

Results: Our findings strongly suggest participants with elevated hs-CRP over a period of 6 years had a strong association with both moderate and severe ICAS. Participants with increased hs-CRP over this 6 years period had increased odds for severe ICAS, however those with deceased hs-CRP did not. Further, when assessing association between Mediterranean diet and ICAS our results were somewhat suggestive of decreased burden of ICAS with Mediterranean diet adherence however, these findings were not statistically significant. Our findings also suggests inflammation (as measured by hs-CRP) may be an effect modifier for the association between Mediterranean diet and ICAS, with those with higher hs-CRP may benefit from Mediterranean diet adherence.

Conclusions: Elevated hs-CRP was positively associated and asymptomatic ICAS after controlling for potential confounders in a US population-based community study. Inflammation may be a risk factor for ICAS in this group, and in those with chronic inflammatory state adherence to Mediterranean diet can be beneficial.

Malcolm Bevel, PhD, Department of Epidemiology and Biostatistics

To Plant or Not to Plant: A Mixed Methods Analysis of the Role of Food Swamps and Deserts on Inflammation and Community Gardening Among African American Women in South Carolina

Introduction: Many chronic diseases are considered to be inflammatory-related and are unfavorably prevalent among the African American (AA) community. Although physical activity and a healthy diet have been previously cited as protective factors in various trials, they are seldom studied in relation to food deserts/swamps, community garden interventions, and inflammatory outcomes among underserved populations. We utilized a two-phase mixed-methods approach to examine the association of residing in a food desert or food swamp and AA women's inflammatory biomarkers and explored their knowledge and beliefs on food availability in their environment (including gardening and community gardening) and its impact on healthy lifestyle goals.

Methods: Secondary data was derived from the Sistas Inspiring Sistas Through Activity and Support (SISTAS) trial, using demographic and inflammatory biomarker information of the cohort of obese AA women. Primary data was collected via key informative interviews (n = 15) to cover items such as health beliefs, social support, knowledge of chronic diseases, and current knowledge of personal and community gardening, respectively. We conducted logistic regression analyses to evaluate the relationship between residing in a food desert/swamp and varying levels of inflammatory biomarkers while adjusting for possible confounders. Transcripts of the interviews were analyzed and interpreted using thematic analysis via NVivo, with multiple reviews of each transcript allowing us proper identification and differences of themes among participants.

Results: After controlling for age and body mass index (BMI), we found non-significant slightly higher risks of high inflammatory biomarker levels among women residing in food deserts/swamps (CRP = 1.18, 95% confidence interval (CI) = 0.82-1.77). Common themes identified from the interviews included the desire for healthier food choices, the lack of knowledge on personal and/or community gardening, and self-efficacy of both personal and community gardening.

Conclusion: The benefits of gardening highlight its feasibility and acceptability for healthy lifestyle promotion in underserved populations who suffer from health and resource disparities.

Ligia Reyes, PhD, Department of Health Promotion, Education, and Behavior

Characterizing the Local Food Environment to Understand Maternal Food Acquisition for Young Children in Rural Mexico

Objective: To understand how mothers navigate their local food environment and what drives their acquisition for foods fed to their children ages 1 to 5 years in rural Mexico.

Methods: In-depth interviews with 46 participants and market observations at 12 food sources were conducted in three rural communities in Mexico. The interviews inquired about mothers' experiences, knowledge, and meanings related to child feeding and their food acquisition using three listings (i.e., foods at home, sources from which foods were acquired, and projected food purchase). These listings were used in market observations at different food sources from which mothers acquired food. All interviews were conducted in Spanish, audio-recorded, transcribed verbatim, verified for quality, and analyzed using the constant comparative method.

Results: Mothers portrayed a diverse local food environment consisting of retail, production, food basket programs, social ties, and wild sources. Access to these food sources depended on characteristics about the food sources as well as mothers' personal conditions. Mothers appraised what they could acquire from each food source

and mitigated financial constraints by capitalizing their time. Mothers valued providing nourishing diets for their children that never lacked a vegetable or fruit, at least once in a while included a flesh animal-source food, and regularly included milk. At the same time, mothers valued responding to children's food preferences and often yielded to their requests. This responsiveness was related to encouraging children's food acceptance, connecting with children's emotions, redirecting children's attention, and child temperament. Yielding to children's requests tended to increase maternal acquisition of unhealthy food products, especially when children were in company at retail food sources.

Conclusion: Responding to child preferences and requests within the local food environment helped normalize acquiring foods for children that deviated from providing a nourishing diet. Understanding how mothers balance these priorities could help inform strategies that promote healthy eating habits from young age.

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Shilpa Constantinides, PhD, Department of Health Promotion, Education, and Behavior
The role of stakeholder framing in nutrition agenda-setting to address the double burden of malnutrition in Tamil Nadu, India

Objective: Addressing the double burden of malnutrition in many low- and middle-income countries through double duty strategies requires understanding of how stakeholder framing influences nutrition agenda-setting at the subnational level where policies are translated to address local context. We aimed to identify differences in frames of undernutrition and nutrition-related non-communicable diseases (NCDs) in Tamil Nadu, India and to show how the frames reflect stakeholder intention and action regarding nutrition actions.

Methods: Tamil Nadu is experiencing chronic undernutrition and increasing NCDs and has a history of

commitment to addressing undernutrition. We conducted in-depth interviews with stakeholders from nutrition-sensitive disciplines using semi-structured questionnaires (n=28). Stakeholder responses and established policy process frameworks guided interview coding and thematic analysis.

Results: The frames of undernutrition and NCDs comprised five domains: problem identification, risk factors, target populations, roles for stakeholders, and policy and program response. To address undernutrition, stakeholders consistently identified problems, risk factors, and target populations. Roles and responsibilities for stakeholders were defined, resulting in multisectoral strategies. For NCDs, stakeholders inconsistently identified the same domains, resulting in lack of convergence and bottlenecks to implementing double duty actions.

Conclusions: Nutrition-related NCDs have not reached a critical level of priority and coherence among state-level stakeholders regarding problem identification, risk factors, target populations, responsibility, and solutions, preventing political commitment to addressing them through inclusion in the policy agenda, dedicated resources, and convergence of multisectoral efforts. Development and implementation of multisectoral double duty strategies likely to be effective at the subnational level will require stakeholders to address three challenges in agenda-setting: adequate priority given to the problem, coherence of the policy community, and convergence of actions by multisectoral stakeholders.

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Elyse Iruhiriye, PhD, Department of Health Promotion, Education, and Behavior
Understanding the role of political commitment and nutrition policy coherence in enabling improvements in nutrition in Rwanda

Objective: Understanding how countries improve children's nutritional status can inform programs and policies and serve as a basis for further improvements. We conducted an in-depth retrospective case study to examine the relationship between improvements in nutrition in Rwanda (1992-2017) and changes in political commitment to nutrition and nutrition coherence across sectors and administrative levels involved in nutrition policy implementation.

Methods: We conducted a review of nutrition-relevant policies and programs from 2000 to 2018 along with 90 semi-structured interviews with key stakeholders in nutrition (national (n=32), mid-level (n=38), and community-level (n=20)) and 40 community-level focus group discussions (FGDs). Both semi-structured interviews and focus group discussions focused on changes and challenges in nutrition. Interviews further discussed the nutrition policy environment, political commitment, and coherence in nutrition. Analysis was conducted according to these categories, emergent themes, and developments in the nutrition policy landscape.

Results: Rwanda experienced increased political and institutional commitment to nutrition through the adoption of a multisectoral nutrition policy that was reinforced with horizontal coordination platforms at national and sub-national levels. These platforms helped transform political commitment into operational and institutional commitment and enhanced addressing nutrition in a multisectoral manner. The role of mid-level actors in nutrition governance strengthened given increased responsibilities at decentralized levels in planning, implementing, and monitoring nutrition programs and services. At the sub-national level, capacity in nutrition, nutrition monitoring and evaluation, and the implementation of coherence were reported to be more optimally implemented in the districts that improved stunting compared to the non-reduced districts. Challenges remained in coordination, capacity in and monitoring of nutrition, and financial commitment in the country.

Conclusion: Political commitment to and coherence in nutrition at national level are important for improving nutrition and when reinforced institutionally can be translated to sub-national levels where implementation occurs.

POSTER ABSTRACTS

Andrea Danielle Brown, Epidemiology and Biostatistics
The association between number of social needs and depressive symptoms among youth and young adults with type 1 diabetes
Jason A. Mendoza, MD, MPH; Edward A. Frongillo, PhD; Kate Flory, PhD; Beth A. Reboussin, PhD, ScM; Elizabeth T. Jensen, PhD, MPH; Lawrence Dolan, MD; Anna Bellatorre, PhD; Faisal S. Malik, MD, MSHS; Santica Marcovina, PhD; Angela D. Liese, PhD, MPH

Objective: To examine the association of unmet social needs (USN) with depressive symptoms among Youth and young adults (YYA) with type 1 diabetes (T1D).

Methods: Data from the SEARCH Food Security ancillary study (2018-2020) were used to examine the cross-sectional association of USN with depressive symptoms among 685 YYA with T1D. The USDA Household Food Security Survey Module was used to measure household food insecurity over the past 12 months (food insecure (≥3 affirmations) vs. food secure). Participants were queried about their primary mode of transportation (personal vehicle vs other form of transportation) and if they had stable housing (all the time vs some or none of the time) over the past 90 days. Total number of USN (0-3) were calculated by summing these items. Depressive symptoms were measured using the Center for Epidemiologic Studies Depression (CES-D) scale (scores 0-60). Linear regression was used to examine the association between number of USN and depressive symptom scores.

Results: Among YYA with T1D (mean age 23.4, SD 4.6 years), 17.1% had household food insecurity, 14.0% lacked adequate transportation, and 4.3% experienced unstable housing; 23.5% had one, 5.1% had two, and 0.9% had three USN. Mean (SD) CES-D score was 14.3 (11.9). Compared to YYA with no USN, those with 1 and 2-3 USN had depressive symptom scores 5.9 and 15.9

points higher, respectively (p<0.0001 for both exposure values), after adjusting for covariates.

Conclusions: USN among YYA with T1D are confluent and are jointly and cumulatively associated with depressive symptoms.

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Rajat Das Gupta, Epidemiology and Biostatistics
The association between household economic status and body mass index among women in Bangladesh
Maxwell Akonde, MLS(AHPC-G); Anthony Alberg, PhD, MPH

Objective: This study investigated the association between household economic status and body mass index (BMI) among Bangladeshi women.

Methods: This cross-sectional study used data from the 2014 Bangladesh Demographic and Health survey, a survey of 17,421 (weighted data) ever married 15-49 year-old women. Household economic status was measured by a wealth index categorized into quintiles. Using an Asia-specific cut-off, BMI was categorized into underweight, normal weight, and overweight/obese. The association between wealth and BMI categories was measured using logistic regression.

Results: The prevalence of underweight was 18.3% and was highest among women in the poorest quintile (50.4%), whereas the prevalence of overweight/obesity was 39.6% and was highest among women in the wealthiest quintile (64.4%). After multivariable adjustment, compared with women in the poorest wealth quintile (odds ratio 1.0), the odds ratios for being overweight/obese increased to 1.27 (95% Confidence Interval (CI) 1.11-1.45) to 1.61 (95 % CI 1.42-1.84) to 2.24 (95% CI 1.94-2.55) to 3.88 (95% CI 3.34-4.52) in quintiles 2, 3, 4, and 5, respectively (p-value for trend<0.001).

Conclusion: Overweight/obesity consistently increased with increasing wealth index among women of reproductive age in Bangladesh. These results contrast upper income countries, where obesity is more concentrated in lower socioeconomic groups. Food insecurity may play a key role. Achieving greater insight into the international differences in the association between wealth and BMI may generate strategies to control the growing prevalence of obesity globally.

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Allyson Malbouf, Health Services Policy and Management

Examining Racial and Ethnic Group Composition and Availability of Grocery Store Outlets by Geography in South Carolina

Melinda A. Merrell, PhD, MPH

Objective: According to the U.S. Department of Agriculture, food insecurity is an economic condition defined by lack of access to enough food to consistently support a household's nutritional needs. As of 2018, over 600,000 South Carolinians struggled with food insecurity. Areas of low food access are often found in communities that are rural and/or have large racial/ethnic minority populations. The objective of this study is to examine the availability of grocery stores across South Carolina by geography and racial/ethnic group composition.

Methods: A retrospective, cross-sectional study design will be used. Demographic characteristics will be obtained from the U.S. Census American Community Survey for years 2015-2019. Available grocery stores as of December 31, 2020 will be confirmed with the Data Axle Reference Solutions dataset. Comparisons will be made at the Census tract level, with the percent of racial/ethnic minority residents analyzed by the number of available grocery store outlets in the same area. Rural-Urban Continuum Codes (RUCC) will define geography.

Choropleth maps will be used to display descriptive statistics.

Results: Preliminary results show that racial/ethnic minority groups have fewer available grocery store outlets in their communities, which may negatively impact their food security. Final results will be available in March 2021.

Conclusions: Grocery store outlets are more readily available to residents of white and urban communities in comparison to areas with a higher percentage of rural and racial/ethnic minority residents. A lack of grocery store outlets in certain areas may enhance food insecurity for families and negatively affect one's overall health.

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Hannah Parker, Exercise Science

Changes in Elementary Schoolers' Dietary Intake During the COVID-19 Pandemic Compared to Preceding Years

Sarah Burkart PhD; Glenn Weaver PhD; Alexis Jones MS; Michael Beets PhD; Roddrick Duggar MPH; Lauren von Klinggraeff MPH; Ethan Hunt MPH; Layton Reesor-Oyer PhD; Bridget Armstrong PhD

Objective: This interrupted time series study examined children's dietary habits during the 2020 COVID-19 pandemic compared to the same calendar periods in 2018 and 2019.

Methods: Parents of 231 elementary schoolers (ages 7-12) from a larger cohort completed the Beverage and Snack Questionnaire on 2-3 random days each week for 6 weeks in Spring and Summer. Foods were classified as healthy or unhealthy based on the Healthy Eating Index. Mixed models compared differences in means and changes in slope between years.

Results: Pre-pandemic (2018 to 2019), there were no significant changes in springtime consumption of healthy

(B = 0.10 95CI 0.00 to 0.10) or unhealthy (B = 0.06, 95CI -0.12 to 0.24) foods. In spring 2020, healthy and unhealthy food consumption increased significantly; children consumed an extra 0.3 (95CI 0.16 to 0.45) healthy and 1.2 (95CI 0.96 to 1.50) unhealthy foods/day. Healthy food consumption accelerated by an extra 0.2 (95CI 0.06 to 0.34) foods/day during the pandemic. While there was a significant increase in unhealthy foods consumed during the pandemic summer compared to previous years, the increase was not beyond expected given previous trends in summer eating habits (B = 0.23, 95CI -.04 to .50).

Conclusions: Increased unhealthy food consumption during the pandemic is concerning given the risk for accelerated weight gain during unstructured time. The pandemic school closures may have altered children's health behaviors by mimicking an 'extended summer vacation,' devoid of external structure. This may contribute to an increase in childhood obesity, warranting public health intervention.

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Krystal Rampalli, Health Promotion, Education, and Behavior
A qualitative investigation of body image and food choice decision-making among Junior High School students in urban Accra, Ghana
Amos Laar, Ph.D., M.P.H., M.A.; Edward Frongillo, Ph.D.; Kenneth Erickson, Ph.D.; Christine Blake, Ph.D., R.D.

Objectives: As Ghana modernizes, adolescents are increasingly exposed to body size ideals incongruent with traditional values. This study explored how attractiveness and body image are conceptualized among urban Ghanaian adolescents and how various sociocultural messages regarding body image influence food choice.

Methods: The Measurement, Evaluation, Accountability, and Leadership Support for NCDs Prevention (MEALS4NCDs) Project measured the nature and extent of unhealthy food marketing. For this study, 48 interviews were conducted with Junior High School students (ages 14-17) in six districts across Accra, Ghana, in July and August 2020. Transcripts were coded and analyzed thematically.

Results: Participants described attractive and unattractive characteristics, some conflicting with traditional African standards valuing larger body sizes. In discussing attractiveness among the same sex, males emphasized "muscularity," "tall stature," and "broad shoulders," while females favored "wide hips" and "a Coca-Cola shape" Both sexes preferred a "flat stomach" and "stylish clothing and hair," and thought "overweight" was "unattractive" and "unhealthy." Most students aspired to change their figure and expressed a need to attain a certain body type to attract romantic partners, reduce physical limitations, and avoid social stigma. To achieve their desired body size, most participants admitted changing diets to the chagrin of their elders who preferred that they ate traditional foods in larger quantities.

Conclusions: Urban Ghanaian adolescents' conceptualizations of attractiveness and body image were influenced by traditional African and modern values obtained from messaging within social networks and media. Future interventions might use social marketing to promote nutritious diets and reduce stigma about body size.

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Lauren Reid, Epidemiology and Biostatistics
Household Food Insecurity and Supplemental Nutrition Assistance Program Prevalence among Youth and Young Adults with Diabetes in South Carolina

Andrea D. Brown, MPH; Hope Bercaw, Edward A. Frongillo, Ph.D.; Jessica Stucker, MSW; Angela D Liese, PhD

Objectives: Household food insecurity (HFI) is prevalent, despite government programs such as the Supplemental Nutrition Assistance Program (SNAP), and it can make diabetes management challenging. This study assessed the prevalence of HFI and SNAP participation among youth and young adults (YYA) with type 1 diabetes (T1D) or type 2 diabetes (T2D) living in South Carolina (SC).

Methods: Participants from SEARCH for Diabetes in Youth were surveyed in 2015-20 and included 413 T1D and 129 T2D (10-34 y; mean: 22.0 y) YYA from SC. Adult participants and parents of minors reported whether they received SNAP benefits and completed the USDA food security questionnaire, where affirming ≥3 items indicated experiencing HFI. Chi-square tests were used to evaluate whether the prevalence of HFI and SNAP utilization differed by demographic characteristics.

Results: In YYA with T1D, 22% experienced HFI, and Non-Hispanic blacks had the highest prevalence (32.4%, p=0.0107). Approximately 16% of YYA with T1D utilized SNAP benefits, with the highest prevalence among females (19%, p=0.0458) and Non-Hispanic blacks (28%, p=0.0002). In YYA with T2D, 34% experienced HFI and 43% received SNAP benefits. SNAP was used in 75% of T2D youth households compared to 40% of T2D young adult households (p=0.0173).

Conclusions: In these YYA with diabetes, the prevalence of HFI exceeded the national prevalence of 10.5% in 2019 and was higher in some groups than in others, suggesting unmet need among this population. Addressing this unmet need is important given that stable food access is essential to appropriate diabetes management.

Claudia Sentman, Health Promotion, Education, and Behavior

Prevalent Recruitment Methods for African American Adults in NEW Soul Community Study
Taylor Duncan; John Bernhart, PhD

Objectives: This presentation summarizes methods used to recruit participants for the Nutritious Eating with Soul (NEW Soul) study in partnership with Rare Variety Café. This 9-month behavioral intervention, led by a community health worker, examines the reach of a soul food, plant-based healthy eating program for African Americans.

Methods: Participants were recruited in two cohorts. An online screening questionnaire prompted participants to select how they were introduced to the study based on a list of recruitment strategies.

Results: The three most reported recruitment methods were social media (23%), radio (22%), and friends and family members (20%). Other strategies included Rare Variety Café, current study participants and staff, websites, work, newspaper, and church. From 199 completed screener forms, 48 individuals were ineligible based on study restrictions. The three most common reasons for ineligibility consisted of: medication for diabetes, inability to travel to the downtown Columbia area where Rare Variety Café is located, and BMI out of the required study range. Successful contact was made with 100 of the 151 eligible individuals for a follow-up 1-on-1 Zoom conferencing meeting. Of these, 86 individuals were invited to an orientation session. Seventy-one individuals attended orientation and 43 completed baseline assessments and enrolled in the study.

Conclusions: The most popular methods for recruiting African American adults for this nutrition study were social media, radio, and peers. These findings suggest that future nutrition interventions prioritizing participation from the African American community

would experience the greatest engagement when applying these recruitment techniques.

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Nadeesda Vidanapathirana, Epidemiology and Biostatistics

The association between fasting times and metabolic and inflammatory biomarkers in the Inflammation Management Intervention (IMAGINE)
Michael D. Wirth, PhD; Gabrielle M. Turner-McGrievy, PhD; Nitin Shivappa, PhD; James R. Hébert, PhD

Objectives: The objective of this research was to examine the association between fasting times and metabolic and inflammatory biomarkers after three months of a dietary intervention.

Methods: The Inflammation Management Intervention (IMAGINE) was an anti-inflammatory diet intervention with primary outcomes assessed at three months. Timing of dietary intake was assessed via three unannounced 24-h dietary recalls at both baseline and three months. Lipids and inflammatory biomarkers (IL6, CRP, TNF- α) were assessed via blood draws at both timepoints. Fasting times were calculated using the average time of the first dietary exposure after waking and average time of the last intake before bed. Linear mixed model analyses were used combining intervention and control participants.

Results: Participants in the lowest fasting time tertile (i.e., lower number of fasting hours per day) had significantly greater reductions in IL6 (1.46 vs. 1.87 pg/mL, P = 0.04), total cholesterol (175 vs. 189 mg/dL, P = 0.04), and insulin concentrations (8.30 vs. 10.69 mU/L, P = 0.01), compared to those in the highest tertile. For a one-minute increase in first mealtime, LDL increased by 0.07 mg/dL (P = 0.01). The interactions between fasting time and timepoint was statistically significant for both CRP (P = 0.03) and TNF-α (P = 0.02). Change in the mean CRP and TNF-α for a one-unit increase in fasting time was

smaller at 3 months compared to baseline.

Conclusions: Longer fasting times are associated with higher CRP, TNF-α, cholesterol, LDL, and insulin. Eating breakfast late may be related to longer fasting time, which may partially explain the fasting time findings.

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Michael Wirth, PhD, College of Nursing

Longitudinal and Cross-sectional Associations between the Dietary Inflammatory Index and Objectively and Subjectively Measured Sleep among Police Officers
Desta Fekedulegn, PhD; Michael E. Andrew, PhD; Alexander C. McLain, PhD; James B. Burch, PhD; Jean E. Davis, PhD, RN; James R. Hebert, ScD; John M. Violanti, PhD.

Objectives: Poor-quality diets and abnormal sleep patterns are common among police officers. Diet can affect chronic inflammation which may influence sleep quality. Associations were examined between the energy-density Dietary Inflammatory Index (E-DIITM) and sleep quality among police officers.

Methods: Data were from the Buffalo Cardio-Metabolic Occupational Police Stress Cohort with baseline in 2004-2009 (n=464), first follow-up in 2010-2014 (n=281), and second follow-up in 2016 (n=191). The E-DII was calculated based on food frequency questionnaire reporting. Sleep was measured objectively (wrist actigraphy) and subjectively (Pittsburgh Sleep Quality Index). Standard repeated-measures linear regression models were fit to examine cross-sectional relationships between E-DII and sleep quality. A second approach assessed longitudinal effects by computing changes in E-DII while adjusting for the baseline E-DII. Effect modification by shift status (day, evening, or night shift) was examined.

Results: Cross-sectionally, a 1-unit pro-inflammatory increase in E-DII was associated with a 1.3-minute increase in wake-after-sleep-onset (WASO, p=0.02). In

models with both longitudinal and cross-sectional effects, with every 1-unit pro-inflammatory increase in change in E-DII score, WASO increased by 1.4 minutes (p=0.07) which was driven by those primarily working day shifts (β=3.33, p=0.01). A worsening of the E-DII over time led to an improvement in sleep efficiency (β=0.52, p=0.04) among night shift workers. Subjective sleep quality improved (β=-0.22, p<0.01) for every 1-unit increase in the change in E-DII score.

Conclusion: More pro-inflammatory diets were associated with a worsening of sleep quality in those working day shifts. Findings among those primarily working nights may be due to differential loss-to-follow-up.

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Longgang Zhao, Epidemiology and Biostatistics
Trends in dietary supplement use among US adults between 2009 and 2018
Nyrobi Tyson, BS; Jihong Liu, ScD; James R Hébert, ScD; Susan E Steck, PhD.

Objectives: A previous study reported that overall use of dietary supplements among United States (U.S.) adults remained stable from 1999 to 2012. However, little is known about trends over the last ten years. We examined trends in dietary supplement use in recent cycles of the National Health and Nutrition Examination Survey (NHANES).

Methods: The NHANES, a serial cross-sectional study of non-institutionalized adults and children residing in the U.S., was used to estimate the prevalence of overall dietary supplements use among adults (age ≥19 y) between 2009 and 2018 (five continuous 2-year cycles). Information about dietary supplement use was collected in an in-home interview by asking the participants whether they used any dietary supplements in the preceding 30 days. Survey-weighted prevalence was calculated to be nationally representative of the U.S. population. We also evaluated the trends across cycles and conducted subgroup analyses by age, sex, race/ethnicity, education status, body mass index, and self-reported health status.

Results: Over five NHANES cycles, data from 28,415 adults ≥19 y were included in current analyses. The sample size ranged from 5,600 to 6,215 across survey cycles. Mean age was 47.2 years. The overall use of any dietary supplements increased between 2009 and 2018 (49.5% in 2009-2010 and 57.4% in 2017-2018, P for trend < 0.001). Use of four or more supplement products also increased from 7.8% to 14.1% between 2009-2010 and 2017-2018 cycles (Ratio = 1.94, 95% Confidence Intervals: 1.52, 2.48, P for trend < 0.001). The observed trend toward increasing was consistent across different age and sex groups, and more pronounced among participants with higher education, higher body mass index, and fair or poor self-reported health status.

Conclusions: The overall use of any dietary supplements among U.S. adults increased during the last ten years. The trend was robust among different population groups. Underlying reasons for these trends warrant further investigation.