



UNIVERSITY OF  
**South Carolina**

NUTRITION CONSORTIUM  
ARNOLD SCHOOL OF PUBLIC HEALTH  
**UofSC NUTRITION SYMPOSIUM: A BRIGHT FUTURE FOR  
NUTRITION RESEARCH AND TRAINING**  
UofSC ALUMNI CENTER  
MARCH 31<sup>st</sup>, 2022

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- 8:15-8:45** Posters to be placed on display in Ballroom One
- 8:30 am** **Registration Opens**
- 9:00-9:05** **Welcome Remarks**  
Dean Thomas G. Chandler, MSc, PhD
- 9:05-9:15** **The Future of UofSC's Nutrition Consortium**  
Christine Blake, PhD, RD
- 9:15-9:45** **Session 1: Introducing New Faculty Affiliates**
- 9:15-9:30** Elizabeth Adams, PhD  
*New frontiers to enhancing public policy on children's food and nutrition security*
- 9:30-9:45** Leila Larson, PhD  
*Enabling children to thrive through nutrition and early learning opportunities*
- 9:45-10:30** **Session 2: Advancing Nutrition Research at UofSC**
- 9:45-10:00** Brie Turner McGrievy, PhD, RD  
*Current research projects in the Behavioral Research in Eating Lab*
- 10:00-10:15** Jim Thrasher, PhD & Rachel Davis, PhD  
*Evaluating nutrition labeling policy changes in the US and Mexico*
- 10:15-10:30** Angela Liese, PhD  
*Rethinking the epidemiologic basis of chronic disease surveillance: Experiences of the DiCAYA Network*
- 10:30-11:15** **Poster Presentations/Open Meet and Greet**

**11:15-11:45 Session 3: Expanding Nutrition Training at UofSC**

**11:15-11:20** Nkechi Okpara, RD, PhD candidate

*Student Nutrition Group (SNG), who are we?*

**11:20-11:35** Jihong Liu, ScD

*Reflections on developing and implementing maternal and child health themed training programs at UofSC*

**11:35-11:45** Christine Blake, PhD, RD

*ACEND Demonstration Program Application for M.S. in Performance Nutrition and Dietetics*

**11:45-12:00 Facilitated Discussion and Closing Remarks: Moving Forward as a Collaborative Consortium**

Christine Blake, PhD, RD

**12:00-1:30 Lunch** (walk to local restaurants or bring your own)

**Afternoon Faculty Affiliate Meetings (by invitation only\*)**

**1:30-3:45 Working Groups**

**3:45-4:00 Working Group Progress Reports**

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\*If interested in participating, please contact [ceblake@mailbox.sc.edu](mailto:ceblake@mailbox.sc.edu).

## ORAL PRESENTATIONS

### **The Future of UofSC's Nutrition Consortium**

This presentation will introduce and provide an overview of the Nutrition Symposium past, present, and future.

Christine Blake, PhD, RD, Associate Professor, Department of Health Promotion, Education and Behavior

**Bio:** Christine Blake is a public health nutrition scientist with extensive experience designing and implementing studies on food choice, food parenting, child feeding, food insecurity, nutrition policy, food environments and food systems, in both rural and urban populations in multiple countries. Her work provides understanding of contextual and cognitive factors that drive food choice with an emphasis on people and organizations that shape these behaviors in families and children. Dr. Blake has conducted both qualitative and quantitative studies on the drivers of food choice in diverse populations and is the principal investigator of the Drivers of Food Choice Competitive Grants Program funded by the Bill & Melinda Gates Foundation and UK FCDO.



### **New frontiers to enhancing public policy on children's food and nutrition security**

During this presentation, Dr. Adams will provide an overview on two of her current studies to inform public policies to enhance children's food and nutrition security. The first study is examining patterns of food security and children's dietary intake across the recent Child Tax Credit expansion. The second study will establish a clinic-to-community partnership with Prisma Health and FoodShare to promote use of SNAP Healthy Bucks for families experiencing food insecurity.

Elizabeth Adams, PhD, Assistant Professor, Department of Exercise Science

**Bio:** Elizabeth Adams' research includes the promotion of healthful dietary patterns to prevent pediatric obesity and reduce health inequities. Her work investigates family and policy-level influences on promoting equitable food access for optimal dietary intake to prevent obesity. Through this work, she aims to ensure children from all income levels have access to healthful nutrition for chronic disease prevention.



### **Enabling children to thrive through nutrition and early learning opportunities**

In this presentation, Dr. Larson will introduce her emerging research focusing on improving nutrition and responsive parenting in early life. She will present findings from a pilot study in Liberia examining the feasibility and acceptability of an integrated nutrition, health, and psychosocial intervention. Her presentation will emphasize the multifaceted approaches to improving early child development worldwide.

Leila Larson, PhD, Assistant Professor, Department of Health Promotion, Education, and Behavior

**Bio:** Dr. Larson's interests lie in community nutrition and human development throughout the lifespan. She is interested in maternal and child nutrition, the consequences of malnutrition, and interventions to improve early life health outcomes in resource limited settings. Dr. Larson works predominantly in global health, studying the risks of poor growth and development and assessing prenatal and postnatal solutions to improve stunting, developmental potential, and other health outcomes. She is also interested in the measurement of early child development, using innovative techniques and assessments to measure brain functioning in young children to study the meaningful impacts of behavioral and nutritional interventions.



### **Current research projects in the Behavioral Research in Eating Lab**

This presentation will provide an overview of the two main research foci of the BRIE Lab, current projects, and future directions.

Brie Turner-McGrievy, PhD, RD, Associate Professor, Department of Health Promotion, Education, and Behavior

**Bio:** Dr. Turner-McGrievy's research focuses on discovering ways to help people eat healthier, lose weight, and prevent chronic disease. To achieve this goal, Dr. Turner-McGrievy explores ways to use emerging technology to assist with dietary self-monitoring, physical activity tracking, and provision of social support. In addition, Dr. Turner-McGrievy's research focuses on dietary approaches that do not require dietary self-monitoring, such as the vegan and vegetarian diets.



### **Evaluating nutrition labeling policy changes in the US and Mexico**

Nutrition labels in the U.S. have been criticized for their complexity and non-prominent locations on the back of packaging. By contrast, Mexico recently implemented an innovative front-of-package labeling policy uses “stop signs” for foods high in calories, sodium, sugar, and saturated/trans fats as well as added caffeine and artificial sweeteners. This system offers consumers more visible and simple information when comparing the relatively healthiness of food when shopping. This presentation will describe a recently funded NIH grant to evaluate the Mexican policy, leveraging data from the International Food Policy Study (IFPS), which since 2018 has been collecting annual surveys on dietary patterns and food policy-related behaviors among 4,000 U.S. and 4,000 Mexican adults. The study will continue annual surveys through 2024 of Mexican consumers, including an oversample of those with lower education, as well as oversamples of U.S. Mexican Americans – a group that

comprises two-thirds of U.S. Latinxs. Preliminary results from the 2021 survey will be described.

Jim Thrasher, PhD, Professor, Department of Health Promotion, Education, and Behavior

**Bio:** Dr. Thrasher's research focuses on how media and policies influence tobacco- and nutrition-related perceptions and behaviors. His projects are generally international in scope and often assess the consistency of media and policy effects across different sociocultural contexts. He teaches courses on public health policy, advocacy, and communications.

Rachel Davis, PhD, Associate Professor, Department of Health Promotion, Education, and Behavior

**Bio:** Dr. Davis's research uses qualitative and quantitative methods to better understand how culture, race, and ethnicity influence health communication and survey methodology, with a particular focus on working with Latinx and African American populations. Dr. Davis's research addresses topics such as how to mitigate culturally associated measurement error in health surveys, how culture influences health behaviors, narrative communication, and tailored health communication. She teaches graduate courses in health communication and research methods



### **Rethinking the epidemiologic basis of chronic disease surveillance: Experiences of the DiCAYA Network**

Given the virtually ubiquitous presence of electronic health records (EHR) in the US health care system, there is increasing interest in relying exclusively on EHR data for chronic disease surveillance, including estimation of prevalence of chronic diseases. The CDC-funded and NIDDK-supported DiCAYA network, which aims to estimate the incidence and prevalence of diabetes in children, youth, and young adults, is one such example of a sustainable surveillance effort. This presentation will outline some early insights into the practical,

methodological, and communication challenges encountered in the context of the first 18 months of the DiCAYA study.

Angela Liese, PhD, Professor, Department of Epidemiology and Biostatistics

**Bio:** Angela D. Liese, PhD, is Professor of Epidemiology at the University of South Carolina's Arnold School of Public Health. Dr. Liese received her PhD in Epidemiology from the University of North Carolina at Chapel Hill and her MPH from the University of Massachusetts at Amherst. Dr. Liese is a diabetes and nutrition epidemiologist. Her current research focuses on surveillance of youth-onset diabetes and the impact of food insecurity and other social needs on the health and well-being of persons who with diabetes.



#### **Student Nutrition Group (SNG), who are we?**

This presentation will introduce the Student Nutrition Group and give the audience a brief overview on the group's purpose and goals. The speaker will share upcoming activities and ways to get involved and become a member!

Nkechi Okpara, RD, PhD candidate, Department of Health Promotion, Education, and Behavior

**Bio:** Nkechi is a 3<sup>rd</sup> year doctoral candidate in the department of Health Promotion, Education, and Behavior and a registered dietitian. Her research interest includes body image and nutrition education among teenage girls. She serves as the President for the Student Nutrition Group, and she is here to share a brief overview what this group entails.



#### **Reflections on developing and implementing maternal and child health themed training programs at UofSC**

In this talk, you will learn Dr. Liu's motivations, strategies, and challenges in developing and implementing training programs in the field of maternal and child health at UofSC and her ideas on how to establish successful collaborations.

Jihong Liu, ScD, Professor, Department of Epidemiology and Biostatistics

**Bio:** Dr. Liu is a perinatal and reproductive epidemiologist. Dr. Liu's research mainly focuses on the social, behavioral, and environmental determinants of obesity and obesity-related behaviors and chronic diseases. More recently, Dr. Liu has expanded her research to examine the intersections of pandemic, COVID-19 infection, and race/ethnicity on severe maternal morbidity and mortality in the US using real-world big data. Overarching themes of Dr. Liu's research are maternal-child health and health disparities. Dr. Liu and her team recently completed a randomized controlled trial of a behavioral lifestyle intervention among pregnant women with overweight or obesity that promote healthy eating, active living, and weight control. Pregnancy and postpartum periods are critical time periods where interventions and policies have great potential to positively impact the health of mothers and their offspring. Dr. Liu leads the Arnold School's maternal and child health experts in bolstering programming and training opportunities in this area.



#### **ACEND Demonstration Program Application for M.S. in Performance Nutrition and Dietetics**

In this talk, you will learn about efforts being led by EXSC to implement a demonstration Program using the ACEND Future Education Model Standards in an M.S. in Performance Nutrition and Dietetics at UofSC. Dr. Christine Blake will provide this update in place of Dr. Shawn Arent.

Christine Blake, PhD, RD, Associate Professor, Department of Health Promotion, Education and Behavior

## POSTER ABSTRACTS



Victoria Adebisi, MPH, Health Promotion Education and Behavior

### **Dietary Acculturation of East Asian Students in the University of South Carolina**

Fahmida Akter, MS; Sharraf Samin, MPH

**Objectives:** International students often struggle with the adoption of new dietary behaviors because of migration to new food environments, and such patterns are poorly understood among East Asian students at the University of South Carolina. This study aimed to examine changes in dietary habits and associated influences among East Asian graduate students, and their perception of healthiness of diets.

**Methods:** In this qualitative study, in-depth interviews were conducted with six East Asian graduate students in the University of South Carolina, who have been living in the US for 2-5 years. Data were analyzed in NVivo 12 software.

**Results:** Four themes emerged from the initial 20 codes which were (1) changes of dietary pattern, (2) aspects of dietary changes, (3) perception of healthy and unhealthy food choices, and (4) effects of COVID-19 on diet and health. During the post-arrival period in US, the reliance on American diet was reported including other habits like skipping meals, dependence on packaged foods, which resulted in weight gain. With improvements in key dietary influences - cooking skills, time management, and availability of ingredients, traditional food consumption increased over time. Diet healthiness was defined as meals with balanced nutrition, and unhealthiness as highly sweetened and oily foods. COVID-19 triggered dependence on processed foods due to restricted outside movements, safety concerns and limited transportation.

**Conclusion:** The dietary influences identified in this study can help develop new university food policies and behavior change interventions for international students. Large-scale studies examining the long-term consequence of dietary acculturation are recommended.

Halide Aydin, MSc, Health Promotion, Education and Behavior

### **Low-cost behavioral nudge and choice architecture intervention to promote fruit and vegetable consumption in elementary schools**

Marcel Marcano-Olivier, PhD; Halide Aydin MSc; Celia Peplow MSc; Amani Al MSc; Mihela Erjavec, PhD.

**Objectives:** The present study implemented a low-cost behavioral nudge and choice architecture intervention, with the aim of increasing fruit and vegetable (F&V) selection and consumption of elementary school children (N = 76) in the lunchroom setting. The study extended upon previous research by Marcano-Olivier (2019) by additionally targeting children with packed lunches.

**Methods:** The intervention included attractive labelling, positioning and serving of F&V. Two days of baseline data were collected followed by one week of the intervention and two days of follow-up, with menus matched at baseline and follow-up. This included a validated method consisting of visual estimation of photos. Two schools were randomized as an intervention and control condition however, data collection for the control condition could not be completed due to school closures following the Covid-19 pandemic.

**Results:** Preliminary findings from the intervention condition showed a significant increase in both servings and consumption of F&V between baseline and follow-up.

**Conclusions:** This has implications for national and global efforts to improve the nutritional health of children in schools.



Hope Bercaw, BS, Epidemiology and Biostatistics

**Health-related social needs and diet quality in youth and young adults with youth-onset type 1 diabetes: cross-sectional findings from the SEARCH food security cohort study**

Andrea D. Brown, MPH; Beth A. Reboussin, PhD; Jason A. Mendoza, MD; Edward A. Frongillo, PhD; Katherine A. Sauder, PhD; Anna Bellatorre, PhD; Amy S. Shah, MD; Tiffany Q. Luong, MPH; Santica M. Marcovina, PhD; Angela D. Liese, PhD

**Objectives:** This cross-sectional study from the SEARCH Food Security Cohort Study (2018-2020) examined the association between unmet health-related social needs (USN) and diet quality among 821 youth and young adults (YYA) with type 1 diabetes (T1D).

**Methods:** Daily dietary intake of calcium, dairy, fiber, and fruits and vegetables (F/V) was estimated with the National Cancer Institute dietary screener questionnaire. USN included having one or more of the following:  $\geq 3$  affirmations on the USDA Household Food Security Survey Module, no personal vehicle in the past year, housing instability over the past 90 days, or health care costs being a big problem. Quantile regression examined associations between USN and diet, and specific USN and diet, controlling for the presence of the other three needs.

**Results:** For YYA with T1D (mean age:  $22.6 \pm 5$ ), 36.9% had 1+ USN, with healthcare unaffordability most prevalent (24.6%), followed by food insecurity (17.5%). Consumption levels were lower across the intake distribution among those with 1+ USN, compared to no USN. After adjustment, those with 1+ USN consumed less calcium at the 10th and 25th percentiles ( $p < 0.05$ ), fiber at the 25th and 50th percentiles ( $p < 0.05$ ), and F/V at the 25th percentile ( $p = 0.02$ ). Independent of the other social needs, food insecurity was associated with lower fiber intake at the 10th, 25th, and 50th percentiles ( $p < 0.04$ ), and F/V intake at the 50th and 75th percentiles ( $p < 0.01$ ). **Conclusions:** USN were associated with reduced intake of calcium, fiber, and F/V largely due to food insecurity, particularly among participants with lower intake.



**Examining Associations between Food Insecurity, Anxiety, and Stress among Young Adults with 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; Catherine Pihoker, MD; Angela D. Liese, PhD, MPH

**Objectives:** Little is known about the association of household food insecurity (HFI) with mental health comorbidities among those with youth-onset diabetes. We examined the association of HFI with stress and anxiety symptoms among youth and young adults (YYA) with diabetes.

**Methods:** Analyses used cross-sectional data from the SEARCH Food Security Cohort study (assessments conducted 2018-2020;  $n = 1030$ , age =  $23.8 \pm 0.3$ , female = 58.8%, type 1 diabetes (T1D) = 881, type 2 diabetes (T2D) = 149). HFI was defined as 3+ affirmations on the USDA food security questionnaire. The Generalized Anxiety Disorder (GAD-7) and Cohen's Perceived Stress Scale (PSS-14) were used to assess outcomes of anxiety (score range 0-21) and stress (score range 0-56), higher scores indicating greater anxiety or stress. Linear regression models were adjusted for covariates and stratified by diabetes-type.

**Results:** HFI was present in 17.3% of T1D and 35.6% of T2D. Moderate/severe anxiety symptom scores (range 10-21) were found in 27.5% (mean=6.9, s.d.=5.5) of T1D and 40.9% (mean=8.4, s.d.=6.5) of T2D. Mean stress scores were 26.7 (s.d.=6.3) for T1D and 27.9 (s.d.=6.3) for T2D. In T1D, HFI was associated with higher anxiety ( $\beta = 4.8$ ,  $p < 0.0001$ ) and stress ( $\beta = 4.9$ ,  $p < 0.0001$ ) symptom scores compared to those with food security adjusted for covariates. Among T2D, HFI was associated with greater anxiety symptoms ( $\beta = 2.8$ ,  $p = 0.0247$ ) but no association was observed with stress.

Conclusions: These findings suggest that assessing and alleviating HFI may help improve stress and anxiety among YYA with diabetes, and further study is warranted to determine associations over time.



Seth Byland, Exercise Science

### **Self-reported Cardiometabolic Health and Dietary Intake in Women Veterans in South Carolina**

Dana Burks; Abbi Lane, PhD; Bridget McFadden, PhD; Ray Thompson, PhD

Objective: Healthy eating is one strategy to maintain health and to lessen the risk of cardiovascular disease (CVD) and diabetes. Women veterans (WV) have higher risk of CVD and diabetes compared to civilian women. Little is known about WV's dietary intake after service. The aim of this abstract was to describe self-reported CVD and diabetes diagnoses and fruit, vegetable, and alcohol intake in WV.

Methods: Data were collected via anonymous survey at the Veteran's Administration Hospital, Veteran's Centers, and other services for veterans in the Columbia, SC area. Participants self-reported diagnoses and the range of servings of fruits and vegetables they consumed per day; either 0-1, 2-3, >3 per day for both fruits and vegetables. Options for weekly alcohol consumption were 0, only on special occasions, 1-2, 3-7, and >7 drinks/week. Responses were tallied.

Results: Thirteen WV completed the survey (mean age=37.6±3.23 years of age; mean BMI=27.69±6.07 kg/m<sup>2</sup>). Two WV reported a hypertension diagnosis; 2 WV reported a diabetes diagnosis. For vegetables, 4 WV (30.8%) consume 0-1 servings/day, 9 (69.2%) consume 2-3 servings/day. No WV (0%) reported >3 servings/day of vegetables. For fruit, 8 WV (61.5%) consume 0-1 servings/day, 3 (23.08%) consume 2-3 servings/day, and 2 (15.3%) consume >3 servings/day. Four WV (30.8%) never drink, 6 (46.2%) drink only on special occasions, 1 (7.7%) has 1-2 drinks/week, 2 (15.4%) have 3-7 drinks/week. No WV (0%) reported >7 drinks/week.

Conclusion: WV may benefit from counseling to increase fruit and vegetable intake.



Alexa Chandler, MS, Exercise Science

### **A Combination of Caffeine, Methylxanthine, and Theacrine Elicits Different Hemodynamic Responses than Caffeine Alone During Simulated Tactical Tasks**

Harry Cintineo, PhD(c); Bridget McFadden, PhD; Marissa Bello, PhD(c); Thomas Cardaci, MS; Caroline Vincenty; Shawn Arent, PhD

Objective: While caffeine, a methylxanthine, is known to increase heart rate (HR) and blood pressure (BP), evidence for tetramethylurates (i.e., theacrine, methylxanthine) suggests minimal impacts on hemodynamics. These compounds may act synergistically with caffeine to enhance cognitive/physical performance, but the lower caffeine content attenuate the hemodynamic responses of caffeine. The purpose of this study was to determine hemodynamic responses to a multi-ingredient supplement versus caffeine-only during rest and tactical simulation tasks.

Methods: Tactically-trained males (n=48) consumed caffeine (CAF; 300mg), combination (CMT; 50mg caffeine + 100mg methylxanthine + 50mg theacrine) or a placebo (PLA). Systolic (SBP) and diastolic (DBP) BP were measured prior to consuming supplements (T0) and at six subsequent timepoints: 30-min rest (T1), 30-min vigilance task (T2), and dynamic movement and marksmanship tasks (T3). All tasks were repeated starting with the 30-min rest (T4-T6). Average HR during each task was calculated. Linear mixed-effects models were used to analyze differences between groups over time ( $\alpha=0.05$ ).

Results: There were significant group effects for BP, as CAF ( $P<0.01$ ) and CMT ( $P<0.01$ ) elicited higher SBP compared to PLA. DBP was higher with CAF ( $P<0.03$ ) than PLA. Analyses revealed time effects for SBP and DBP ( $P<0.01$ ). HR was significantly higher at T1-T6 ( $P<0.01$ ).



Conclusion: While both CAF and CMT increased SBP, only CAF showed higher DBP. This more favorable hemodynamic response with CMT may be attributed to the lower CAF dosage. CMT should be explored as an alternative ergogenic aid to CAF especially for those sensitive to CAF or with hypertension.



Kelli DuBois, MS, Health Promotion, Education, and Behavior

### **Diet-Associated Inflammation, Physical Activity, and Health-Related Outcomes in Ulcerative Colitis**

Christine Blake, PhD, RD; Caroline Rudisill, PhD; Sayward Harrison, PhD; James Hebert, ScD

Introduction: Individuals diagnosed with Ulcerative Colitis (UC) seek complementary lifestyle methods, such as diet and physical activity (PA), to self-manage disease symptoms psychosocial challenges. This study explored the associations between Energy Adjusted Dietary Inflammatory Index (E-DII™) scores, PA, and UC-related health outcomes.

Methods: Data obtained from participants in the IBD Partners e-cohort who self-reported UC (n=2,052) were analyzed using a cross-sectional, secondary data analysis. Dietary data were converted into an E-DII score. Multivariable regression models controlled for age, sex, BMI, race, education, diet, PA, smoking status, medication class, and disease duration.

Results: A higher E-DII score (indicating pro-inflammatory dietary intake potential) was significantly associated with increased disease activity, anxiety, depression, fatigue, and sleep disturbance, and decreased health-related quality of life (QoL) and satisfaction with social role. PA was associated with decreased disease activity, anxiety, depression, fatigue, and sleep disturbance, and increased health-related QoL and satisfaction with social role. The benefit among health outcomes was greater for strenuous exercise intensity than for moderate or mild intensities. For all

outcomes, interaction effects between E-DII and PA were not significant.

Discussion: These findings suggest that an anti-inflammatory diet and PA are each complementary lifestyle methods that may contribute to decreases in disease activity, anxiety, depression, and fatigue, as well as improvements in health-related QoL, sleep, and satisfaction with social role. Such modalities may aid in managing systemic and localized inflammation associated with UC and reduce the burden of UC on daily living.



Emily Farrell, Epidemiology and Biostatistics

### **Associations between the Dietary Inflammatory Index and sleep metrics in the Energy Balance Study (EBS)**

Michael D. Wirth, PhD, MSPH; Alexander C. McLain, PhD, MS; James R. Hebert, ScD, MSPH; Steven Blair, P.E.D., MS

Objectives: Sleep is a physiological necessity with strong inflammatory underpinnings. Diet is a strong moderator of systemic inflammation. This study explored the associations between the Dietary Inflammatory Index (DII) and sleep metrics from the Energy Balance Study (EBS).

Methods: The prospective EBS (n=427) was designed to study energy intake and expenditure on body composition. Sleep was measured using BodyMedia's SenseWear® armband. Energy-density (E-D IITM) scores were calculated from micro and macronutrients from three unannounced dietary recalls, via telephone interviews at baseline, 1-year, 2-year, and 3-years. The E-DII was analyzed as a continuous metric and categorically (very anti-inflammatory, moderately anti-inflammatory, neutral, and pro-inflammatory). Linear mixed-effects models estimated the impact of the E-DII score on various sleep parameters, then stratified by race and sex.

Results: Cross-sectionally, individuals whose diet was more pro-inflammatory, saw a later bedtime ( $p < .01$ ) and later waketime ( $p = .02$ ) compared to those who had a very anti-inflammatory diet. As a continuous metric,

every one-unit higher E-DII score was associated with less sleep duration ( $\beta=-1.30$ ,  $p=0.04$ ), later bedtime ( $\beta=3.92$ ,  $p<0.01$ ), and later waketime ( $\beta=2.61$ ,  $p<0.01$ ). Longitudinally, for every one unit increase in the change in E-DII score, individuals whose diet became more pro-inflammatory, sleep duration decreased ( $\beta\text{Change}=-1.5310$ ,  $p=.03$ ) and bedtime became later ( $\beta\text{Change}=3.0941$ ,  $p<.01$ ). For the longitudinal results, some notable interactions were observed between race or sex and the change in the E-DII for timing of sleep. Conclusions: Future diet interventions should focus on decreasing inflammatory properties in diet to improve sleep metrics among those experiencing trouble with sleep.



Kaji Keya-Korotki, MS, MPS, Health Services Policy & Management

#### **Trend of childhood nutrition and breastfeed practices in Bangladesh, 2007- 2017**

Eric Korotki, PhD-ABD, MBA

Objective: Primary objective was to identify the trend of stunting and under weight status of children under age 5 in Bangladesh. The secondary objective was to identify exclusive breast feed practice among 0-5 months children.

Methods: The nationally representative data from Bangladesh Demographic and Health Survey 2007, 2011, 2014 and 2017-18 were analyzed. World Health Organization's (WHO) Child Growth Standards i.e. height-for-age and weight-for-age measurement were used to determine the level of stunt, and underweight status of the children. If a child is more than 2 standard deviations below the reference median (-2 SD) height-for-age standard of the population is considered stunt and below 3 standard deviations below the median height was considered as severely stunt.

Result: In 2017, 31% of children under age 5 were stunted and 9% were severely stunted. The level of stunting among children under 5 has declined from 43%

in 2007 to 31% in 2017. Stunting was more common in rural children (33%) compared to urban children (25%). In 2017, 22% of the children under age 5 was under weight and 4% was severely underweight. The level of underweight has decreased from 41% in 2007 to 36% in 2011, to 33% in 2014 and 22% in 2017. In 2007 43% infants under age 6 months were exclusively breastfed, compared to 64% in 2011, 55% in 2014 and 65% In 2017. Conclusion: We found that child nutritional status both in terms of stunt and underweight have improved steadily over the past decade.



Bezawit Eyob Kase, MSc, Epidemiology and Biostatistics  
**The development and evaluation of a literature-based Dietary Index for Gut Microbiota**

Angela D. Liese, PhD; Jiajia Zhang, PhD; E. Angela Murphy, PhD; Longgang Zhao, MSc; Susan E. Steck, PhD  
Objectives: To develop and evaluate a novel dietary index for gut microbiota (DI-GM) that captures dietary composition related to gut microbiota profiles.

Methods: A literature review of longitudinal studies on the effect of diet on gut microbiota in adult populations was conducted, extracting those dietary components with evidence of beneficial or harmful effects on gut microbiota. Using 24-hour dietary recall data from the National Health and Nutrition Examination Survey (NHANES, 2005-2010,  $n=3,821$ ), DI-GM scores were computed and associations with biomarkers of gut microbiota diversity (urinary enterodiol and enterolactone) were examined using linear regression. Results: From a review of 121 articles, 14 foods were identified as components of the DI-GM, including fermented dairy, chickpeas, soybean, whole grains, fiber, cranberries, avocados, broccoli, coffee, and green tea (beneficial components) and red meat, processed meat, refined grains, and high fat diet ( $\geq 40\%$  of energy from fat) (harmful components). Each component was scored 0 or 1 based on sex-specific median intakes and scores were summed to develop the DI-GM score. In NHANES, DI-GM scores ranged from 0-13 with mean 4.8 (SD=0.04).

Positive associations between DI-GM and urinary enterodiol ( $\beta=0.123$ , 95%CI: 0.079, 0.166) and enterolactone ( $\beta=0.138$ , 95%CI: 0.091, 0.184) were observed after multivariable adjustment for sociodemographic and lifestyle factors.

Conclusion: A novel DI-GM was developed based on published literature to score the quality of diet in terms of maintaining healthy gut microbiota. The DI-GM was significantly associated with markers of gut microbiota diversity in NHANES, signifying the potential utility of this index for gut-health related studies.



Mary Quattlebaum, BA, Department of Psychology  
**Identifying Predictors of Family Mealtime Frequency and Quality through an Adolescent-Parent Dyad Lens among African American Families**

Dawn K. Wilson, Ph.D.; Allison M. Sweeney, Ph.D.

Objectives African American (AA) adolescents are at elevated risk of living in obesogenic environments, which may contribute to low-quality dietary intake and associated obesity risk. Family mealtime builds capacity for health behaviors and has been associated with improved adolescent dietary intake. Limited studies, however, have assessed predictors of family mealtime using adolescent and parent report among AA families and few studies have assessed the quality of the mealtime, as most studies have measured mealtime frequency. Thus, this study assessed predictors of family mealtime frequency and quality among overweight/obese AA adolescent-parent dyads. Methods: Baseline data were collected from 235 AA adolescent-parent dyads (adolescent Mage=12.8±1.8; MBMI%=96.6±4.3; %female=63.5% [adolescents], 95.9% [parents]) that participated in the Families Improving Together for Weight Loss trial. Validated psychosocial questionnaires included measures of intrapersonal, interpersonal, and environmental supports. Family mealtime frequency and quality were measured with a validated scale.

Results: Hierarchical linear regression analyses demonstrated that autonomous motivation for diet

( $B=0.19$ ,  $SE=0.065$ ,  $p=0.004$ ) and parental autonomy-support for health behaviors ( $B=0.35$ ,  $SE=0.065$ ,  $p<0.001$ ) were both significant predictors of greater adolescent-reported family mealtime quality. Further, results indicated that parental monitoring of child health behavior was predictive of greater parent-reported family mealtime frequency ( $B=0.359$ ,  $SE=0.144$ ,  $p=0.013$ ).

Conclusions: These findings indicate the importance of autonomous motivation, parental autonomy support, and parental monitoring of health behaviors in association with family mealtime. Our findings align with prior research from our group demonstrating that positive communication and interaction fostered at mealtime is important to adolescents, whereas parents are perhaps more concerned with frequency of mealtime.



Longgang Zhao, MS, Epidemiology and Biostatistics  
**Dietary Patterns and Lung Cancer: A Systemic Review of Observational Studies**

Bezawit Kase, MS; Jiali Zheng, PhD; Susan E. Steck, PhD  
Objective: Previous literature reviews summarized the associations between individual foods or food groups and lung cancer risk, but the relationship between dietary patterns (DPs) and lung cancer has received less attention.

Methods: A systematic review of observational studies on the associations between DPs and incidence of lung cancer was conducted by searching PubMed, Web of Science, and Embase from inception to January 2022. Two authors independently abstracted data and assessed quality of the included studies.

Results: A total of 25 studies including 15 cohort studies, two case-cohort studies, and eight case-control studies were identified. Twelve studies reported on data-driven DPs (4 prospective studies, 8 case-control studies) and 14 studies reported on a priori DPs based on predefined dietary guidance (13 prospective studies, 1 case-control study). A prudent DP (higher in vegetables, fruit, fish, and/or white meat), was significantly associated with lower risk of lung cancer in three of five studies. In

contrast, Western DPs, characterized by higher intakes of refined grains and red and processed meat, were significantly associated with higher risk of lung cancer among three of five case-control studies and one out of two cohort studies. The Mediterranean diet (4 out of 8 prospective studies) and Dietary Approaches to Stop Hypertension (2 out of 3 prospective studies) showed inverse associations with lung cancer.

Conclusions: Our systematic review indicates DPs characterized by higher intake of vegetables and fruits and lower intake of red and processed meat may be associated with a reduced risk of lung cancer.

