



CENTER FOR RESEARCH  
IN NUTRITION AND HEALTH DISPARITIES  
ARNOLD SCHOOL OF PUBLIC HEALTH

**8TH ANNUAL  
HEALTHY EATING IN CONTEXT SYMPOSIUM**

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USC ALUMNI CENTER, PRESIDENTIAL BALLROOM  
APRIL 13, 2018

**10:00-10:15 CHECK IN & NETWORKING**

*Coffee and tea*

**10:15-10:30 WELCOMING REMARKS**

SONYA JONES, DIRECTOR

**10:30-11:50 HIGHLIGHTS OF THE AFFILIATES' RESEARCH & INITIATIVES**

1. **Angela Liese.** Food Shopping and Acquisition Behaviors in Relation to BMI among Residents of Low-Income Communities in South Carolina (10:30-10:50)
2. **Myriam Torres.** Pasitos Adelante: Addressing Childhood Obesity among Hispanic Children (10:50-11:10)
3. **Jennifer Mandelbaum.** Does social capital moderate the association between children's emotional overeating and parental stress? (11:10-11:30)
4. **Robert Weaver.** The Arnold Childhood Obesity Initiative: Current and future directions. (11:30-11:50)

**11:50-12:05 NETWORKING BREAK**

*Buffet lunch served*

**12:05 – 1:05 KEYNOTE ADDRESS**

**Healthy food access: stories from the field**

**Diane M. Harris**

**1:05- 1:15 NETWORKING BREAK**

*Light snacks*

**1:15-1:45 POSTER SESSION**

**1:45- 2:00 CLOSING REMARKS**

## ORAL ABSTRACTS

Angela D. Liese, Xiaonan Ma, Brent Hutto, Patricia A. Sharpe, Bethany A. Bell and Sara Wilcox

### **Food Shopping and Acquisition Behaviors in Relation to BMI among Residents of Low-Income Communities in South Carolina**

Low-income areas in which residents have poor access to healthy foods have been referred to as “food deserts.” It is thought that improving food access may help curb the obesity epidemic. We evaluated the association of food shopping and acquisition with body mass index (BMI) among 459 residents of low-income communities from two South Carolina counties, 81% of whom lived in food deserts. Multivariable linear regression analysis was employed. Our study sample comprising largely African-American women had an average BMI of 32.5 kg/m<sup>2</sup>. The vast majority of study participants shopped at supermarkets (61%) or supercenters/warehouse clubs (27%). Shopping at a supercenter or warehouse club as one’s primary store was significantly associated with a 2.6 kg/m<sup>2</sup> higher BMI compared to shopping at a supermarket, independent of demographics, socioeconomic, physical activity, and all other food shopping/acquisition behaviors. Persons who reported shopping at a small grocery store or a convenience or dollar store as their tertiary store had a 2.6 kg/m<sup>2</sup> lower BMI. Respondents who perceived lack of access to adequate food shopping in their neighborhoods as a problem had higher BMI. Living in a food desert census tract was not significantly associated with BMI, nor were distance to utilized and nearest grocery stores. These findings call into question that poor spatial access to grocery stores is affecting the obesity epidemic. Future research should consider assessing foods purchased and dietary intake within a comprehensive study of food shopping behaviors and health outcomes among persons living in food deserts. (Funded by NIH/NCI R01CA180336)



Myriam E Torres, Consortium for Latino Immigration Studies

### **Pasitos Adelante: Addressing Childhood Obesity among Hispanic Children**

Patricia Urriola, Yajaira Benet Uzcategui, Heidi Furman, Myriam Torres

Pasitos Adelante started almost three years ago as a collaboration between PASOs and the Beaufort Jasper Hampton Comprehensive Health Services Inc. (BJHCHS) to address the risk of obesity among Latino children. This is a promotora-based program where the Community Health Worker (Promotora) receives referrals from the ob/gyn and/or pediatrician when they see a pregnant Latina or a child in their practice. Before entering the visit with the pediatrician, the parent answers the Childhood Obesity Toolkit that has been translated to Spanish by PASOs and the Consortium for Latino Immigration Studies at the University of South Carolina. The parent receives specific information from the pediatrician's office based on the goal set on the survey. The promotora then follows up with the parent and provides any support they may need to achieve the goal. Data from January 2016 to November 2017, show that 171 mothers have received support with breastfeeding (97 mothers initiated); 104 Hispanic children were flagged by the pediatrician for obesity and referred to the PASOs CHW; 68 families received nutrition education at a home visit or in the clinic; 58 families set a behavior-change goal and of those, 50 families achieved that goal. The goal most frequently chosen by Hispanic families was 'eat more fruits and vegetables', followed by 'drink less sweetened beverages'. In addition to outcome evaluation, we are conducting process evaluation that has been shared with physicians and staff at BJHCHS. This culturally and linguistically appropriate program is successful in fighting the childhood obesity epidemic in South Carolina.



Jennifer Mandelbaum, Department of Health Promotion, Education, and Behavior, University of South Carolina

### **Does social capital moderate the association between children’s emotional overeating and parental stress?**

Background: Parental stress has been shown to be associated with children’s eating behaviors. The stress-buffering hypothesis suggests that social resources (i.e., network-accessed resources) may prevent or attenuate the impact of

stress on a person's health. Little research has examined whether the potential stress-buffering benefits of social resources may extend from parents to their children.

**Methods:** Using data from a community-based birth cohort of mother-child dyads, this study examined whether parental social capital moderated the association between parental stress and children's emotional overeating (EO). Mothers completed health questionnaires on an annual basis and a one-time social network questionnaire in 2011-2012. EO was measured using the Children's Eating Behavior Questionnaire. Parental stress came from the 18-item Parental Stress Scale. Social capital was measured using a position generator and based on the number of occupations to which a mother had access. Poisson regression analysis was used.

**Results:** Parental social capital moderated the positive association between greater parental stress and children's EO, such that stress was associated with children's EO in only those mothers with low social capital.

**Discussion:** This study suggests that social capital may disrupt the transmission of stress from parent to child, thereby playing a potential role in the production and reproduction of health inequalities.



## POSTER ABSTRACTS



1. Jennifer Mandelbaum, Department of Health Promotion, Education, and Behavior, University of South Carolina

### **Barriers to Exclusive Breastfeeding and Motivations for Early Introduction of Formula Among Latina Mothers in Columbia, SC**

Jennifer Mandelbaum, Maryam Alhabas and Anna Mesa.

**Background:** Current infant feeding recommendations call for exclusive breastfeeding for six months postpartum. Exclusive breastfeeding confers health benefits for mothers and infants including reduced risk of postpartum depression, optimal infant growth and development, and protection against

infections, allergic diseases, and chronic diseases. Latina women in the U.S. have among the highest rates of breastfeeding initiation across all racial/ethnic groups, yet by six months postpartum, the proportion of exclusively-breastfed infants drops below the national average. Data indicate that Latina mothers are more likely to introduce formula as early as the second day of life. This pilot study offers potential explanations for why Latina mothers in Columbia, SC initiate early combination feeding (breast milk and formula).

**Methods:** In-depth semi-structured interviews were conducted with Latina mothers in Columbia, SC who had given birth to at least one child currently between six months and five years of age who was combination-fed (n=6). Interviews were analyzed using a structured, grounded theory approach, with NVivo 10 used to finalize coding and extract quotes.

**Results:** Although mothers believed that breastfeeding was best, they accepted combination feeding as a means to provide their infants necessary nutrition. Among mothers who combination-fed, philosophies about motherhood may be associated with a perceived inability to provide for their infant, despite structural forces influencing their decision.

**Conclusions:** It is imperative to understand barriers to exclusive breastfeeding and motivations for early introduction of formula in this population in order to design and implement culturally-appropriate interventions that promote breastfeeding among Latina mothers.

2. Hayli Marshall, University of South Carolina

### **Effects of parents' social networks on children's eating behavior**

**Background:** Dietary behaviors are directly and indirectly affected by the social environment through mechanisms such as modeling and reinforcement. Research suggests that parents are the strongest influence on children's health behaviors, yet few studies have examined how parents' social ties may influence their children's diets. This study aimed to evaluate associations between the composition of parents' social networks and their children's diets. **Methods:** Data came from a subsample of Montreal-based parent-child

dyads (n=280) from the Brain-to-Society study, a cross-sectional study examining drivers of childhood obesity. Survey data were collected on the social networks, income, and nutrition habits of parents and their children. Social network data were collected using three name generator questions on close friends, persons with whom the respondent discussed important matters, and persons with whom they discussed nutrition. Children's nutrition was assessed through a 24-hour recall, and responses were aggregated into healthy and junk food indices. Data were analyzed using linear and Poisson regression, adjusted for sociodemographic characteristics. Results: Respondents whose social networks contained a higher percentage of fellow parents were positively associated with healthy food index scores among children (b=2.18, SE=1.02). Parental social networks containing a higher percentage of parents were negatively associated with junk food scores among children (b=-0.63, SE=0.19). Conclusion: Findings suggest that parents' social networks influence their children's overall dietary quality. Interventions aiming to improve healthy eating among children may benefit from involving parents and their social ties. Future research might examine how different social mechanisms within parental social networks influence children's dietary habits.



3. Julianna M. Jayne, University of South Carolina

### **The Shape of the Army: BMI Trajectories of U.S. Army Soldiers from 2011-2014.**

Objective: To establish the shape and determinants of body mass index (BMI) trajectories among Soldiers, we aimed to (1) model the overall BMI trajectory of Soldiers, (2) find the most common trajectory groups among Soldiers, (3) investigate the relationship between BMI trajectories and sociodemographic and military specific characteristics, and (4) determine if there were Soldiers with large variability in BMI caused by weight fluctuations.

Methods: Study population included all U.S. Army Soldiers on active-duty between 2011 and 2014 who were age 17-62 (n=827,126). Using longitudinal data from the Stanford Military Data Repository, we used group-based trajectory modeling to identify the BMI trajectories of Soldiers and

multinomial logistic regression to estimate associations between Soldier characteristics and trajectory membership.

Results: Four distinct BMI trajectory groups were found: increasing, decreasing, constant, and inconstant. The constant, increasing, and decreasing trajectories were identical in shape and percentage between men and women. The constant trajectory had the fewest Soldiers who exceeded weight standards or had duty limitations. The increasing trajectory was associated with marriage and fewer service years. The decreasing trajectory was associated with more years of service and higher educational attainment. The inconstant trajectory differed in shape between men and women. Over 6% of men and 12% of women had fluctuations in BMI indicative of weight cycling.

Conclusions: Characteristics of Soldiers, such as service years, age, and limitations to duty are associated with BMI trends. Understanding and utilizing these characteristics may assist the Army in targeting resources aimed to improve Soldier health and combat readiness.



4. Courtney Cooper, Health Promotion, Education, and Behavior at The University of South Carolina

### **Tailoring the Development of an e-Health Intervention for Pregnant Women: Results from a Web-based Needs Assessment of Intervention Components.**

INTRODUCTION: Electronic health (e-health) interventions delivered through mobile applications (apps) and websites hold potential as convenient and readily available resources for women during pregnancy. This needs assessment examined pregnant women's interest in components considered for development of an e-health intervention focused on preventing excessive gestational weight gain.

METHODS: Using Facebook and Twitter social media sites, pregnant women living in the U.S. who owned a smartphone were recruited to complete a one-time online survey. The survey included questions regarding parity, health-related information sought by pregnant women, and interests in electronically delivered health information. Chi-square analyses were conducted to examine differences in interest levels of e-health intervention components by parity.

RESULTS: Of the 329 pregnant women who completed the survey, 46.2% of participants were nulliparous (first-time

moms). Regarding online group-based exercise challenges, 69.3% of multiparous women were interested in participating, compared to 85.5% of nulliparous women ( $\chi^2=21.329$ ,  $p<0.001$ ). Similarly, significantly less multiparous women expressed interest in listening to weekly podcasts that provide pregnancy health-related information, compared to nulliparous women (66.7% vs. 80.3%,  $\chi^2=19.902$ ,  $p=0.001$ ). There were no significant differences by parity concerning interest in group-based challenges related to healthy eating ( $p=0.076$ ), or using a mobile app to communicate with other pregnant women ( $p=0.447$ ) or track gestational weight gain ( $p=0.644$ ). Nulliparous women indicated descriptively higher interest levels for all proposed intervention components. DISCUSSION: Parity may play an important role in tailoring intervention components to pregnant women. Nulliparous women showed greater interest and may be more engaged in an e-health intervention than multiparous women.



5. Melanie Sutherland, Department of Epidemiology and Biostatistics, Arnold School of Public Health, University of South Carolina

#### **Socioeconomic Profiles as Predictors of Glycemic Control in Youth and Young Adults with Type 1 Diabetes**

Measures of socioeconomic status (SES) predict glycemic control in youth and young adults (YYA) with type 1 diabetes (T1D); however, rarely have multiple SES factors been considered simultaneously, including parental education and income, food security, health insurance status, and food assistance. The purpose of this study was to identify multidimensional SES profiles in YYA with T1D and to assess the association between these profiles and glycemic control.

Data from 257 YYA with T1D enrolled in the SEARCH Food Insecurity Study in South Carolina and Washington between the years 2013 and 2015 were included. We identified SES profiles utilizing latent class analysis and used multivariable logistic regression to compare the profiles' glycemic control, with HbA1c > 9% defined as poor glycemic control. Two profiles were identified: Profile 1 (74%) included YYA that were of higher parental income and education, and less likely to have government-funded health insurance, to receive food assistance, and to be food insecure. Profile 2 (26%) included YYA who were categorized opposite to that of profile 1. After

adjustment for age, sex, race/ethnicity, site, diabetes duration, and diabetes medication, YYA in profile 2 were significantly more likely to have poor glycemic control relative to YYA in profile 1 (OR = 1.94, 95% CI = 1.01 - 3.71). Membership to a lower SES profile is associated with poor glycemic control among YYA with T1D. Strategies to improve glycemic control, particularly in YYA who belong to lower SES profiles, are needed.



6. Riley Griffin, University of South Carolina

#### **Drive-throughs and Dine-ins: Examining meal behaviors of pregnant women in an intervention for healthy gestational weight gain**

BACKGROUND: Frequently eating meals prepared away from home (AFH) has been associated with high caloric intake. Excessive consumption of calories is associated with weight gain and obesity, which is recognized as a growing public health concern. Pregnancy is a critical time for obesity prevention among mothers, as gestational weight gain (GWG) can be modified through healthy eating (HE) behaviors. This study aims to examine self-reported patterns of eating meals prepared AFH (i.e., FF and sit-down restaurants) among pregnant women participating in a study targeting GWG.

METHODS: Participants received an intervention targeting HE and physical activity (PA) or a comparison program targeting stress reduction and management (SRAM). Online surveys administered at baseline and post-intervention included the Rapid Eating Assessment for Participants to collect self-reported frequency of meals prepared AFH. Body Mass Index (BMI) and GWG was calculated using self-reported height and weight. Chi-square, correlations, and independent samples t-tests were used.

RESULTS: Average pre-pregnancy BMI was 26.4±5.6 (n=139). GWG was not correlated with meals prepared AFH. A greater proportion of HEPA participants reported a reduction in FF intake since joining the program compared to SRAM participants (71.1% vs. 26.5%,  $p<0.01$ ). Reported frequency of FF consumption (times/week) was higher among overweight/obese women (M=2.2±1.3) compared to normal weight (M=1.1±1.3,  $p<0.01$ ). Similar patterns were observed for meals consumed from restaurants (M=1.2±1.2 vs. M=1.9±1.6,  $p=0.03$ , respectively).

CONCLUSION: Interventions targeting healthy eating behaviors led to a reduction in the consumption of meals prepared AFH. Additional tailored messaging and strategies are needed to reduce the consumption of these meals among overweight/obese women.



8. Morium B Bably, University of North Carolina at Charlotte

#### **Evaluation of Food Scores in the USA.**

Nutrition is a critical component to health because an unhealthy or poor diet can contribute to infectious and chronic diseases including diarrhea, diabetes, coronary heart disease, hypertension, and cancer and globally, most of these diseases are leading cause of disability and mortality. Providing a healthy food score for a variety of food and beverage items would give consumers a simple piece of information that would help them choose between one food and another. The current literature synthesis assesses and compares food scores presented in the peer reviewed literature. The articles were identified through peer-reviewed databases including PubMed, Web of Science, CINAHL, and Google Scholar using different search terms relevant to food score. The evaluation of food scores was kept limited to the USA because the food pattern and diet varies from country to country. Preliminary, 8 food scores were identified along with their pros and cons. The primary results indicate that, i) the algorithm used to score individual food is complex, ii) three of the food scores are relatively old and not applicable for current dietary guidelines, iii) lacks including both healthy and unhealthy nutrients, and iv) lacks validity and reliability. The objective of this study was to understand the advantages and disadvantages of the existing scores or tools in the USA. The overall results of this study suggest creating a simple and comprehended food score to help individuals, public health nutrition experts, health professionals, and researchers to determine the appropriate food choices.



9. Gail W. Wagner, Dept. of Anthropology, University of South Carolina

#### **Conflicted Understanding of Vegetable**

Vegetable is an interesting and somewhat elusive cultural domain for Americans that refers to selected edible plant portions. As a fuzzy category that is based on function and often learned by example, vegetable is not easily defined.

7. Cindy Horton Dias, USC College of Nursing PhD student

#### **Qualitative Inquiry into the Dietary Behaviors of Shift-work Nurses in Hospitals**

Background/significance: Nurses, like the general American population, are not meeting dietary recommendations for health promotion and chronic disease prevention. Nurses' health is impacted by the dietary choices made every day, including while at work. It is not known to what extent nurses prioritize healthy eating while at work or what nurses perceive as major influencers in the hospital setting. Understanding the unique influences that nurses encounter is paramount to the development of programs that target healthy eating in the workplace.

Purpose: The purpose of this study is twofold: 1) to explore nurses' experiences with dietary behaviors in the workplace; and 2) examine nurses' perceptions of barriers and facilitators related to shift work and the hospital setting on making healthy nutritional choices.

Methods: This qualitative descriptive study is guided by the Theoretical Domains Framework, and has been approved by the USC IRB. Participants will include Registered Nurses working 10-12 hour shifts within a regional hospital system. After consent is obtained, interviews and focus groups will be audio-recorded and transcribed for thematic analysis.

Results: Anticipated findings will include primary influences on eating behaviors most relevant to nurses.

Implications: Diet is the leading contributing factor in long-term health promotion and chronic disease prevention, and should be emphasized in programs targeting nurses' health. More information is needed about the unique influences on dietary choices that nurses encounter in the hospital setting, especially for those working shifts. Findings can inform hospital food policies, workplace wellness program interventions, nursing administration practices, and nursing education.

Nevertheless, vegetable is a term used in many American food-related situations despite the fact that the U.S.D.A. does not provide a usable definition of a culinary vegetable. Instead, on the ChooseMyPlate.gov web page, to answer the question “What foods are in the vegetable group?” the following unhelpful answer is given: “Any vegetable or 100% vegetable juice counts as a member of the Vegetable Group”. I report on over 680 interviews collected mostly by undergraduate students at the University of South Carolina under a project approved by the IRB. People’s categorization of specific foods or dishes as vegetable or not are influenced by a number of factors, including cross-classification with dietary nutritional components, personal likes/dislikes/acquaintance, confusion over whether cooking or combining ingredients alters classification, and confusion between botanical and culinary categories. A better understanding of what people understand when told to eat more vegetables is crucial for successful nutritional counseling.



10. Mary Wilson, MPH Prevention Research Center, Arnold School of Public Health, University of South Carolina

**Effective recruitment strategies for enrolling African American adults in nutrition intervention research studies**

Purpose: To determine essential elements of effective recruitment strategies for enrolling African American (AA) adults interested in improving blood pressure, cholesterol levels, and weight in a two-year nutrition intervention research study. The Nutritious Eating With Soul (NEW Soul) Study will examine how plant-based and low-fat (standard) soul food diets may help improve heart disease risk factors and nutrition, in AA adults, and help with weight loss.

Methodology: Local media and community venues were identified as recruitment outlets. These outlets included radio stations (Glory Communications and Alpha Media) with a predominately AA listening audience and television stations with AA news anchors (NEWS 19). Community partners were identified including Palmetto Health Employee Health, SC FoodShare, the Carolina School for Inquiry, Richland County School District 1, Eat Smart Move More Richland County, SC Department of Health and Environmental Control, Holy

Strokes, and AA churches. Recruitment tables were set up at health-related venues (Richland County Main Library Farmers Market and “Living Well Columbia” Health Fair). Lastly, we worked with our partner restaurants (Universal Love Vegan Café, Rawtopian Bliss, and Bert’s Southern Cooking) to post fliers and discuss recruitment options. Interested participants were directed to [www.newsoul.org](http://www.newsoul.org) to complete a screening questionnaire. The questionnaire asked participants to identify where they learned about the study. Our recruitment goal was n=80 to invite to orientation.

Results: Between December 13, 2018-February 28, 2018, 272 persons completed the questionnaire to enroll; 211 qualified and 93 enrolled to attend orientation. The most successful recruitment strategies were the radio (29.2%), friend/family (28.8 %), and television (16.1%).

Conclusion: When conducting a nutrition intervention research study for AA, it is essential that recruitment personnel are embedded in the AA community across multiple sectors. Recruitment efforts should include engagement with diverse community stakeholders and should be distributed through multiple media outlets for maximum reach.



11. Marty Davey, MS, RD, LDN, Arnold School of Public Health

**Making traditional and popular soul food recipes more healthful while maintaining cultural relevance**

Purpose: To examine energy, total fat, fiber, and sodium differences in regional soul food restaurant menu items versus recipes revised using the dietary recommendations of the NEW Soul Study, a plant-based dietary intervention among African American adults targeting cardiovascular disease prevention.

Methodology: Using an online search strategy (Google, Yelp), the top 15 local (Columbia, SC) soul food restaurants were identified. Menus of restaurants were compared to identify the top five most common main course, side dish, and dessert items across all restaurants. Standard recipes were analyzed using the USDA nutrient database and compared to recipes employing the vegan, low/no oil and low sodium recommendations of the NEW Soul study (e.g., meat analogues vs. meat, vegetables seasoned with broth vs. fatback).

Results: Comparing the nutrient values of the standard vs. revised menu items, energy content for main entrees, sides, and desserts was reduced by 48%, 37%, and 29% respectively. Fat content for main entrees, sides, and desserts was reduced by 73%, 70%, and 25% respectively. Fiber content for main entrees, sides, and desserts was increased by 67%, 6%, and 31% respectively. Sodium content for main entrees, sides, and desserts was reduced by 62%, 29%, and 22% respectively. [See table]

Conclusion: Conventional soul food recipes are typically high in energy, fat, and sodium, and low in fiber, all of which can contribute to cardiovascular disease. Using the NEW Soul recommendations, however, traditional soul food recipes can be prepared in a more healthful method, while maintaining the cultural relevance of the foods. Future iterations of the recipes will further transform the ingredients to rely more on whole foods versus meat analogues (e.g., BBQ lentils vs. BBQ mock chicken sandwich). The remainder of this study will examine the palatability of these recipes as well as other health outcomes.

