Behavior and Education Theory

P101 Comparison of Food Sources of Energy Among Adults that Skip Versus Consume Breakfast

Stephanie Fanelli, MS, RDN, Stephanie.Fanelli2@osumc.edu, The Ohio State University, College of Medicine, Division of Medical Dietetics and Health Sciences, Atwell Hall, 453 W 10th Ave, Columbus, OH, 43210; Christopher Taylor, PhD, LD, RDN, FAND, The Ohio State University, College of Medicine, Division of Medical Dietetics and Health Sciences

Background: Breakfast consumption is associated with lower rates of chronic disease and higher intakes of vitamins and minerals, including calcium, folic acid, and zinc. Skipping breakfast may further pose a threat to diet quality, which may result in less desirable food choices later in the day. Previously, breakfast consumption in children was examined, yet less is known regarding adults.

Objective: To examine the proportional contribution of food sources to energy intake for adults who skipped vs ate breakfast.

Study Design, Setting, Participants: This cross-sectional study used data from 31,514 adults, aged 18 years+, from the 2005-2016 National Health and Nutrition Examination Survey. Participants were categorized according to whether they skipped ($n = 4,993$) or ate ($n = 26,521$) breakfast on the recorded day of intake.

Measurable Outcome/Analysis: Dietary intakes were assessed by a 24-hour dietary recall and meal occasions were self-designated by participants. Food sources were categorized into What We Eat in America Food Categories. Sums of energy were aggregated and used to determine the proportions of energy from each food source for the total day as well as during breakfast and snacks.

Results: Adults who skipped breakfast consumed greater proportions of total energy from mixed dishes, sweetened-beverages, alcoholic beverages, and sandwiches, and less energy from breads, plant-proteins, milk, fruit, and eggs than those who ate breakfast. Breakfast energy mainly came from breads, eggs, and milk. Snack energy came from sweetened-beverages, alcoholic beverages, sweets, and savory snack-foods for those who skipped breakfast. For adults who ate breakfast, it came from sweets, alcoholic beverages, and savory foods; however, they also consumed more plant-proteins and fruit than those who skipped breakfast.

Conclusions: Making 1 poor nutritional decision, such as skipping breakfast, likely leads to other poor nutritional decisions throughout the day. Educational efforts should address breakfast's role in promoting nutritional adequacy and improving overall diet quality.

Funding: American Dairy Association Mideast.

P102 Development of a Stage of Change Algorithm for Environmentally-Conscious Protein Choices

Beth Carlton, bacarlton@my.uri.edu, The University of Rhode Island, 45 Upper College Rd, Kingston, RI, 02881;

Samantha Pender, The University of Rhode Island; Janette Bedoyan, MS, RD, The University of Rhode Island; Jade McNamara, PhD, RD, The University of Maine; Geoffrey Greene, PhD, LDN, RD, The University of Rhode Island

Background: Stage of Change (SOC)-based interventions have been effective for behavior change but few have been developed to assess sustainable eating behavior. No algorithm assessing motivational readiness to make environmentally-conscious protein choices has been previously developed.

Objective: To develop a SOC algorithm for environmentally-conscious protein (ECP) choices.

Study Design, Setting, Participants: Development was initiated using a cross-sectional survey of participants ($n = 400$) enrolled in introductory classes. Participants ranged from 18-24 years old and received extra credit for completion. The ECP SOC algorithm was recoded for this study categorizing participants as pre- or post-action.

Measurable Outcome/Analysis: ECP groups were compared using chi-square and t-tests for animal protein (AP) consumption, attitude toward food and long-term health impact (LTH), green eating SOC (GE), attitude toward plant-based foods (PBF), and attitude toward the impact of meat on the environment (MOE).

Results: Participants were predominantly white (83%), female (80%) and averaged 19 ± 1.2 years. Most participants (70%) were in pre-action stages for ECP. Fifty-seven percent in pre-action consumed AP 4-6 days a week vs 41% of those in post-action ($P < .001$). Those in pre-action were less likely to always choose foods for LTH (22%) vs post-action (51%) ($P < .001$). Eighty-eight percent in pre-action for GE were also pre-action for ECP, while 47% of post-action for GE were post-action for ECP ($P < .001$). Fifty-one percent in pre-action believed in eating mostly PBF to sustain health vs 79% in post-action ($P < .001$). Lastly, post-action were more likely to contemplate the impact of MOE every time they ate meat (26%) vs pre-action (10%) ($P < 0.001$).

Conclusions: The ECP SOC algorithm successfully distinguished pre- and post-action stages by behavior and attitudes. The consistency of these results with previous research provides support for the continued development of the ECP SOC algorithm. Future research is needed to validate this algorithm and to determine if it can be used for interventions to facilitate behavior change.

Funding: None.

P103 Employing Social Norms to Influence Healthier Food Choices

Denise Farrell, BS, MSA, dnfrell@memphis.edu, University of Memphis, College of Education, Ball Hall Rm 100, Memphis, TN, 38152; Leigh Williams, PhD, University of Memphis; Karen Kitchens, PhD, University of Memphis

Background: To build on prior laboratory studies related to injunctive food norms, the goal of this field-experiment was to explore factors that influence patrons' food choices in a university cafeteria.

Objective: To evaluate the influence of food messaging (ie, injunctive norms) at a designated food station in the

Continued on page S65

P103 (continued)

cafeteria, with the goal of encouraging healthier food choices and exploring factors that influence patrons' food choices.

Study Design, Setting, Participants: We employed an interrupted time series, quasi-experimental design. During the 10-day baseline phase, patrons were asked to complete a survey. During the intervention, 3 copies of healthy injunctive signs were placed in the cafeteria and patrons were asked about the signage.

Measurable Outcome/Analysis: Within each survey, we collected the patrons' food choices, noting how many and what type of side items each purchased to compare the proportion of patrons purchasing at least 1 healthy side item using a 2-sample proportion test. During the intervention, we asked patrons if they saw the sign and what they remembered. Several items from a modified version of The Eating Motivation Survey was also asked to determine what influenced patrons' food choices.

Results: The 2-sample proportion test for 200 baseline participants and 170 intervention participants ($z = -1.55$, $P = .12$) did not indicate a difference in the proportion of patrons purchasing at least 1 healthy side-item during the experimental weeks. Approximately 40% of the patrons during intervention week remembered seeing the signage and 24% recalled some detail of the signage.

Conclusions: This study sought to determine if employing social norms through food signage influenced patron's side-item choice. While the results did not show a significant difference in choosing healthier items, the patrons' recall of the sign shows promise for how colleges can implement and encourage healthier eating habits on their campuses.

Funding: None.

P104 Theory-Informed Predictors of Fruit and Vegetable Intake Among Cost-Offset Community Supported Agriculture Enrollees

Jennifer Garner, PhD, RD, jennifer.garner@osumc.edu, The Ohio State University, 453 West 10th Ave, Columbus, OH, 43210; Katherine Petro, BA, The Ohio State University; Karla Hanson, PhD, Cornell University; Alice Ammerman, DPH, RD, University of North Carolina at Chapel Hill; Stephanie Jilcott Pitts, PhD, East Carolina University; Jane Kolodinsky, PhD, MBA, University of Vermont; Marilyn Sitaker, MPH, The Evergreen State College; Rebecca Seguin-Fowler, PhD, RD, CSCS, Texas A&M AgriLife Research

Background: In cost-offset, community-supported agriculture (CO-CSA), low-income households receive subsidized shares of locally-grown produce with the aim of improving their access to and consumption of fruits and vegetables (FV). Social Cognitive Theory (SCT) is a commonly leveraged behavior change theory and informed the design of a CO-CSA plus nutrition education intervention trial for low-income households.

Objective: To examine the cross-sectional relationships between SCT-related variables and FV intake among

CO-CSA enrollees at baseline. We hypothesized that nutrition-related attitudes, beliefs, and self-efficacy as well as perceived FV availability and accessibility would be significant predictors of FV intake.

Study Design, Setting, Participants: In Spring 2016 and 2017, adult enrollees ($n = 305$) completed a baseline questionnaire containing study-specific and validated questions to measure nutrition-related psychosocial (knowledge, attitudes, and beliefs), environmental (FV availability and accessibility), and behavioral factors (self-efficacy) in relation to self-reported and proxy measures of FV intake (National Cancer Institute's All-Day FV Screener and resonance Raman spectroscopy to assess dermal carotenoid status).

Measurable Outcome/Analysis: Descriptive statistics and multiple regression models were completed in SPSS. Models controlled for demographic characteristics.

Self-efficacy to prepare and eat FV ($\beta = 0.27$, $P \leq .001$) and in-home FV availability ($\beta = 0.13$, $P = .04$) were significant predictors of self-reported daily FV intake ($R^2 = 0.121$, $P \leq .001$). In-home FV availability ($\beta = 0.20$, $P \leq .001$), accurate knowledge of FV recommendations ($\beta = 0.15$, $P = .008$), and perceived geographic access to FV ($\beta = 0.11$, $P = .046$) were significant predictors of carotenoid status ($R^2 = 0.227$, $P \leq .001$).

Conclusions: Among a set of SCT-related variables, knowledge of FV recommendations, geographic access to FV, in-home availability of FV, and self-efficacy to prepare and eat FV were significant predictors of FV intake. However, these only explained 22-23% of outcome variability among a sample of CO-CSA adult enrollees. SCT alone may not be the most appropriate theory through which to understand potential levers of FV intake among adults participating in CO-CSA programs.

Funding: USDA

P105 Using Theater to Explore Poverty and Food Insecurity Issues in an Undergraduate Community Nutrition Course

Margot Zaharek-Girgasky, PhD, RDN, CD-N, mzaharekgirgasky@usj.edu, University of Saint Joseph, 1678 Asylum Ave, West Hartford, CT, 06117; Amanda Stone, RDN, University of Saint Joseph

Objective: To explore the potential of theater as part of an undergraduate community nutrition course in shaping students' attitudes, beliefs, and empathy toward individuals experiencing food insecurity and living in poverty.

Use of Theory or Research: The benefits of arts-based curricula has been well-documented in other health and social service disciplines. Theater, poetry, and art can broaden students' understanding of complex social problems, foster engagement, and promote empathy. These skills and capabilities are important for nutrition educators. However, few studies have investigated the potential role of arts-based education in nutrition/dietetics coursework, and to our knowledge, no studies have been published to-date on the use of theater.

Continued on page S66