



### ABSTRACTS

#### BEHAVIORAL HEALTH

##### Apps to improve diet, physical activity and sedentary behavior in children and adolescents: A review of quality, features and behavior change techniques.

Schoeppe S, Alley S, Rebar A, et al. *Intl J Behav Nutr Phys Act*. 2017; <http://dx.doi.org/10.1186/s12966-017-0538-3>.

The researchers aim to systematically evaluate the content and quality of popular apps to improve diet, physical activity, and sedentary behavior in youth, with a secondary aim of examining the relationships between app quality and number of app features and behavioral change techniques (BCT) incorporated into the app. A systematic literature search was devised to investigate this issue. A sample of 25 apps was selected for study. Of the app sample, 18 came from iTunes and Google Play, four from Google Play, and three from iTunes; 15 were free, 4 were paid, and 6 were Freemium. Inclusionary criteria were apps available in iTunes, Google, Play or both; targeting children or adolescents; focused on diet, physical activity, and/or sedentary behavior; available in English; and having a user rating of at least 4+ based on a minimum of 20 ratings. Apps targeting adults or health behaviors not being studied here were excluded. App selection and assessment were undertaken between June and November 2016 using a search for the terms *physical activity, physical fitness, exercise, sport, walk, sedentary behavior, sitting, inactive, screen time, diet, nutrition, healthy eating, fruit, vegetable, snack, soft drink, and carbonated beverages*. The initial search yielded 42,599 apps, which were narrowed down to 25 by using the eligibility criteria. App quality was assessed using the Mobile App Rating Scale (MARS). Frequencies of each of the 26 BCTs included in the apps were calculated. Krippendorff's  $\alpha$  was used to evaluate interrater reliability for the app quality assessment and the presence of BCTs. All statistical analyses were conducted using SPSS Statistics version 22.0 (IBM, 2013). The researchers reported that popular commercial apps to improve diet, physical activity, and sedentary behavior had moderate quality overall, scoring higher in terms of functionality.

#### BUSINESS & INDUSTRY

##### Association between store food environment and customer purchases in small grocery stores, gas-marts, pharmacies and dollar stores.

Caspi C, Lenk K, Pelletier J, et al. *Intl J Behav Nutr Phys Activity*. 2017; <http://dx.doi.org/10.1186/s12966-017-0531-x>.

Researchers test whether customers at nontraditional food stores purchase healthier products when health-promotions are in place. A cross-sectional study was designed to address this. A sample of 140 stores and data from 594 customers were utilized. The store sample was 40% corner stores, 30% gas-marts, 8% dollar stores, and 21% pharmacies. The customers were 58% male with a median age of 40 years; 48% were white, 36% were black, 3% were Hispanic, and 4% were Asian. The study was conducted July through November 2014 in Minneapolis and St Paul, MN. Store lists were obtained from licensing agencies and exempted from participation if not stocking minimal amounts of food, not participating in the Supplemental Nutrition Assistance Program, misclassified, or unwilling to participate in the study. In teams of two, data collectors visited each store twice: once to assess the store environment, and a second time to collect purchase data from customers exiting the store between 9 AM and 6 PM Monday through Friday, and 11 AM and 7 PM Saturday and Sunday. Store environment was assessed using a version of the Nutrition Environment Measure Survey in Stores. Fruit and vegetable availability was measured in pounds available and number of varieties. Store marketing features assessed included advertisements and product placement using a modified tool developed by the CX<sup>3</sup> retail scoring system (California Department of Public Health).

Shelf space for fruits and vegetables was measured using a standard tape measure and compared to space available for less-healthy foods. To examine the associations between store environment features and purchases, researchers computed multilevel linear regression models and logistic regression models with store identification treated as a random effect to account for nesting. Analyses were performed using SAS/STAT software version 9.4 (SAS Institute, 2002-2012). Researchers reported relatively few customers purchased fruits, vegetables, or whole grains. Higher scores were associated with shelf space devoted to healthy items.

#### COMMUNITY NUTRITION

##### Testing a beverage and fruit/vegetable education intervention in a university dining hall.

Scourboutakos M, Mah C, Murphy S, et al. *J Nutr Educ Behav*. 2017;49(6):457-465.

Researchers test the effect that physical activity calorie equivalent (PACE) labeling combined with messaging has on university students' beverage choices in the cafeteria. A secondary objective was testing the effect of messaging encouraging students to increase fruit and vegetable consumption. A repeat cross-sectional study was designed to address this. The sample utilized for the study was the student population at University of Toronto who ate daily in one select dining hall, with between 368 and 510 students visiting during each of the six dates. The students utilizing the hall lived in-residence, were 69% female, and aged 18 to 23 years old. The intervention was scheduled between September 2014 and April 2015. The main outcomes were beverage choice and vegetable/fruit bar visits. The intervention included both a

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beverage and fruit/vegetable education campaign utilizing posters to encourage healthy choices. Data were collected by two-person collection teams in person, in the dining hall, between 4:30 and 7:30 PM on six separate menu occasions before the intervention and six again afterwards. Data were collected on Tuesdays and Wednesdays due to higher attendance volume. One collector was stationed at the beverage area and manually recorded the sex and beverage volume and choice of each student. The second collector did the same at the fruit and vegetable bar, recording the frequency and choice of foods there, as well as the sex of each student. The total number of students choosing each option was tabulated and calculated as a proportion of total visits to the stations. All analyses were conducted using SAS version 9.3 (SAS Institute, Inc, 2011). The authors report a significant decrease in the proportion of students selecting a sugar-sweetened beverage before vs after the intervention, as well as an increase in the choice of water. Consumption of fruits and vegetables also increased.

## CULINARY

### Vegetarian diet as a risk factor for symptomatic gallstone disease.

McConnell T, Appleby P, Key T. *Eur J Clin Nutr*. 2017; <http://dx.doi.org/10.1038/ejcn.2016.252>. Researchers examine the incidence of developing symptomatic gallstone disease between vegetarians and non-vegetarians. A cohort study was designed to address this. Data were analyzed from a sample of 49,652 adults for this study. The sample was drawn from the European Prospective Investigation into Cancer and Nutrition project conducted throughout the United Kingdom. The sample was 77% female and 33% vegetarian at baseline. Records were rejected if lacking in detailed dietary and lifestyle data, as were those individuals under 20 or over 90 years old at the point of recruitment. Other exclusionary criteria was presence of malignant cancers except nonmelanoma skin cancer, unknown smoking status, unknown body mass index, or those with self-reported histories of gallstones. Participants in the study provided dietary information concerning 130 different food types over a 12-month period, as well as vegetarian status and history of using that diet plan; self-reported height and weight were used to calculate body mass index, and smoking status was also self-reported, as was alcohol consumption and education attainment. The outcome sought was incident symptomatic gallstone disease diagnosis found by cross-checking relevant national databases. Person years were calculated from the latest between date of recruitment or the

beginning of hospital records data through the first hospital diagnosis of symptomatic gallstone disease. All analyses were stratified by sex, method of recruitment, region of residence, and adjustments made for smoking, alcohol use, education level, Townsend deprivation index, and long-term medical treatment. Statistical analyses were conducted using STATA software 13 (StataCorp, 2013). Researchers reported a highly significant association between increased body mass index and risk of symptomatic gallstone disease and, after adjusting for body mass index, a smaller association between vegetarian diet and the same.

## DIABETES CARE

### Dietary patterns and type 2 diabetes: A systematic literature review and meta-analysis of prospective studies.

Jannasch F, Kroger J, Schulze M. *J Nutr*. 2017; <http://dx.doi.org/10.3945/jn.116.242552>.

The researchers evaluate the association between dietary patterns (DPs) and type 2 diabetes while considering the heterogeneity of different statistical approaches for generating DPs. A systematic literature review and meta-analysis of prospective studies was designed to address this issue. A grouping of 48 articles comprising 16 cohorts was utilized for the analysis and review. The articles utilized were all prospective studies, with 22 conducted in the United States., 18 in Europe, 5 in Asia, and 3 in Australia. Of the sample, 8 articles evaluated the association between the Mediterranean diet and diabetes, while 6 studied the Healthy Eating Index (HEI) or Alternate Healthy Eating Index (AHEI) diet and same, and 5 the Dietary Approaches to Stop Hypertension (DASH) diet. The researchers searched MEDLINE and the Web of Science databases up through December 31, 2015, and covered four thematic areas: dietary habits and DPs, *a priori* and *a posteriori* statistical approaches to generate DPs, type 2 diabetes, and prospective design of the studies. A hierarchical approach was applied for screening articles—screened titles, abstracts, full texts—with disagreements settled by consensus. Exclusionary criteria included articles using single food groups or nutrients, as well as studies with cross-sectional or retrospective design; studies concerning gestational diabetes or type 1 diabetes; and those restricted to patients with diabetes, impaired glucose tolerance, insulin resistance, or other chronic diseases. The meta-analysis was undertaken using Cochrane RevMan version 5.3 (Cochrane, 2013) and pooled estimates were calculated according to pattern approach. The authors report evidence suggesting strong potential for the Mediterranean diet, DASH, and AHEI to prevent diabetes.

## ONCOLOGY

### Development, implementation, and evaluation of evidence-based cooking videos for cancer survivors.

Fitz E, Warner J, Braun A, et al. *J Nutr Educ Behav*. 2017;49(6):525-526.

The authors conduct a pilot study examining the feasibility of cancer survivor-specific cooking videos, while determining participant satisfaction and perception. To address this, a pilot program was created. A sample of 249 individuals was utilized with a mean age of 53 years, 86% female, all of whom were cancer survivors. The study was conducted in conjunction with the Garden of Hope at Ohio State University in 2015. The program consisted of two cancer survivor-specific recipes and accompanying cooking videos developed by an oncology dietitian and medical chef. The recipes included sweet potato veggie burgers and kale chips designed as substitutes for common hamburgers and potato chips. Nutritional analyses of the recipes were conducted using research-based nutrient analysis software (Nutrition Data System for Research, 2013). The videos included dietitian narration detailing both the preparation methods and the cancer-fighting benefits of the various foods, with key information highlighted on the screen. Video run-times were 2 minutes and 16 seconds for the kale chips and 4 minutes and 41 seconds for the sweet potato burger. Cancer survivors were recruited to watch via e-mails targeting cancer survivor support community listservs. The videos, print-ready recipes, and an evaluation survey were made available via a secure web portal for those consenting to participate. Insight and feedback were gathered via Likert-scale questions and open-ended responses. A total of 249 unique individuals viewed both videos, and 146 completed the online evaluation. Data were analyzed by coding open-ended responses to find emerging themes. Exposure and reach were measured through tracking metrics assessing website hits and video views. The authors report a significant percentage of the participants stated they're more likely to utilize evidence-based survivor dietary protocols as a result. Three overarching themes identified were improved confidence in using a plant-based diet, requests for additional videos, and limitations in relation to cancer-related food intolerances.

## PEDIATRICS

### Vitamin D and fracture risk in early childhood: A case-control study.

Anderson L, Heong S, Chen Y, et al. *Am J Epidemiol*. 2017;185(12):1255-1262.

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