

CHOICES/EARLY Annotated Bibliography

As of 1/2/18

CHOICES Manuscripts Published/In Press (n=11)

1. Gardner J, Kjolhaug J, Linde JA, Sevcik S, Lytle LA. Teaching Goal-Setting for Weight-Gain Prevention in a College Population: Insights from the CHOICES Study. *Journal of Health Education Teaching*. 2013; 4(1):39-49. PMID: PMC4038901

This article describes the effectiveness of goal setting instruction in the CHOICES (Choosing Healthy Options in College Environments and Settings) study, an intervention evaluating the effectiveness of weight gain prevention strategies for 2-year college students. Participants randomized into the intervention enrolled in a course that taught strategies to help maintain or achieve a healthy weight. Participants were instructed in SMART (Specific, Measurable, Attainable, Realistic, Time-based) and behavioral goal setting practices. Throughout the course, participants set goals related to improving their sleep, stress-management, exercise, and nutrition. Evaluation of the goals revealed that efforts to teach behavioral goal-setting strategies were largely successful; however efforts to convey the intricacies of SMART goal setting were not as successful. The insights gained from the goal-setting activities of this study could be used to guide educators who utilize goals to achieve health behavior change.

2. Lytle LA, Moe SG, Nanney MS, Laska MN, Linde JA, Petrich CA, Sevcik SM. Designing a weight gain prevention trial for young adults: the CHOICES study. *American Journal of Health Education*. 2014; 45:67-75. PMID: PMC4043377

The Choosing Healthy Options in College Environments and Settings (CHOICES) study was funded to create a technology-based program for 2-year college students to help prevent unhealthy weight gain. The primary hypothesis of CHOICES was that students randomized to the intervention condition would experience a smaller increase in mean BMI post treatment, as compared to students randomized to the control condition. We collected baseline data and randomized 441 students into the study. The 24-month CHOICES intervention focused on four key behavioral areas: 1) diet and nutrition; 2) physical activity and sedentary behaviors; 3) sleep; and 4) stress management and consisted of two overlapping phases that included both a one-credit class offered through the colleges and a social network and support website. The CHOICES intervention utilized strategies shown to be effective in behavior change, including self-monitoring, goal setting, skill building, enhancement of self-efficacy, role modeling, positive social influences and use of reinforcement and incentives. Our experience in working with 2-year colleges to design and implement a randomized controlled intervention trial for their student body was successful because there was a recognized need for weight control programs and healthy weight-related education for 2-year college students.

3. Linde JA, Sevcik SM, Petrich CA, Gardner JK, Laska MN, Lozano P, Lytle LA. Translating a Health Behavior Change Intervention for Delivery to Two-Year College Students: The Importance of Formative Research. *Translational Behavioral Medicine*. 2014; 4(2):160-169. PMID: PMC4041923

The purpose of this study was to conduct formative research for a randomized controlled weight gain prevention trial among two-year college students, to ensure appropriateness of content and delivery of a curriculum originally developed for four-year college students. Data were collected from community college students, faculty, and staff from October 2009 to August 2011. The formative evaluation was conducted in three stages: focus groups and key informant interviews with 30 faculty/staff and 57 students; pilot testing of the online curriculum with 54 students; and beta testing of the social network and support website with 13 students. Based on focus groups and interviews, program content, course delivery modes, and communication channels were adjusted to meet population interests and preferences. The course was delivered successfully in pilot testing, and the website was received well by beta testers. Health behavior change programs targeting two-year college students can and should be

tailored with attention to the unique demographics, interests, and needs of the target population, as two-year college students are older, more racially and ethnically diverse, and at greater risk for obesity on average compared to four-year college students. This study highlights the need for formative evaluation across multiple domains and with key informant sources for successful implementation of interventions that meet population needs.

4. Nanney MS, Lytle LA, Farbakhsh K, Moe SG, Linde JA, Gardner JK, Laska MN. Weight and Weight-Related Behaviors Among 2-Year College Students. *Journal of American College Health*. 2015; 63(4):221-229.

PMCID: PMC4428949

The purpose of this paper was to describe weight indicators and weight-related behaviors, including sex differences, of 441 students enrolled in three Minnesota 2-year colleges who participated in the Choosing Healthy Options in College Environments and Settings (CHOICES) study. During Fall 2011 and Spring 2012 participants completed a baseline survey evaluating eating and activity patterns, sleep, and stress and completed measures of height, weight, waist circumference, and body fat. Participants were primarily female (68%), White (73%), with a mean age of 22.8 years and 66.2% reported an annual income <\$12,000. Almost half (47%) were overweight or obese. About two-thirds of the young adults were regular breakfast eaters; about half bought fast food at least 1-2 times a week and they drank, on average, 22 sugary and sugar-free beverages a month. Despite being more likely to live with parents, young males appeared to engage the most in risky health behaviors and had higher levels of overweight or obesity, but were more satisfied with their weight compared to young females. These findings confirm the need for innovative interventions targeting this understudied and underserved young adult population.

5. Laska MN, Sevcik SM, Moe SG, Petrich CA, Nanney MS, Linde JA, Lytle LA. A 2-year young adult obesity prevention trial in the US: Process evaluation results. *Health Promotion International*. 2016 Dec;31(4):793-800.

PMCID: PMC5141943

Our objective was to conduct a process evaluation of the CHOICES (Choosing Healthy Options in College Environments and Settings) study, a large, randomized, controlled trial designed to prevent unhealthy weight gain in young adults (aged 18–35) attending 2-year community colleges in the USA. The 24-month intervention consisted of participation in an academic course and a social networking and support website. Among intervention participants, completion rates for most course activities were >80%, reflecting a high level of dose received. Course retention and participant satisfaction were also high. Engagement results, however, were mixed with less than half of participants in the online and hybrid sections of the course reporting that they interacted with course materials ≥ 3 h/week, but 50–75% reporting that they completed required lessons ‘all/very thoroughly’. Engagement in the website activities was also mixed with more than half of intervention participants logging onto the website during the first month, but then declining to 25–40% during the following 23 months of the intervention. Intervention engagement is a challenge of online interventions and a challenge of working with the young adult age group in general. Additional research is needed to explore strategies to support engagement among this population, particularly for relatively long intervention durations.

6. Pelletier JE, Laska MN, Lytle LA. Stress, Health Risk Behaviors, and Weight Status among Community College Students. *Health Education and Behavior*. 2016; 43(2):139-144.

PMCID: PMC4752929

The objective of this study was to describe the relationship between stress, weight-related health risk behaviors (e.g., eating behaviors, physical activity, sedentary behavior, sleep, cigarette smoking and binge drinking), and weight status using cross-sectional data on 2-year community college students enrolled in a randomized controlled weight gain prevention trial. Modified Poisson regression and linear regression were used to examine crude and adjusted cross-sectional associations. Higher stress was associated with higher prevalence of overweight/obesity (crude PR=1.05 [95% CI 1.01, 1.09]), though the relationship was no longer statistically significant after controlling for a wide range of weight-related health risk behaviors (adjusted PR=1.04 [95% CI 1.00, 1.08]). Stress levels were significantly associated with meal skipping and being a current smoker. Future research should investigate the

mechanisms through which stress is related to obesity risk and examine the causes of stress among this understudied population to inform the design of appropriate interventions.

7. Moe SG, Lytle LA, Nanney MS, Linde JA, Laska MN. Recruiting and retaining young adults in a weight gain prevention trial: Lessons learned from the CHOICES study. *Clinical Trials*. 2016; 13(2):205–213.

PMCID: PMC4785077

The Choosing Healthy Options in College Environments and Settings (CHOICES) study was funded to evaluate the effectiveness of a weight gain prevention intervention for young adults, more specifically 2-year college students. Little is known about how to recruit and retain participants in these programs; therefore, this paper describes the methods used to recruit and retain the colleges and their students, describe the sample and discuss recommendations for future studies. Four hundred and forty-one (441) young adult students were recruited into this 24-month trial and completed measurement assessments at baseline, 4-, 12- and 24-months follow-up. Ultimately, 83.4% of the randomized cohort participated in the 24-month assessment period. Those retained more often were white ($p=0.03$), compared to those who dropped out or were lost to follow-up; no other socio-demographic factor (e.g., gender, ethnicity, education), BMI, body fat, waist circumference or weight status was observed to differ between randomly assigned groups. We learned that two-year colleges and their students are interested in participating in weight-related trials and partnering with universities for research but that the researchers must work closely with college administrators to identify benefits to their institutions and to resolve student-level barriers to recruitment and retention. Our experiences from the CHOICES study should be useful in identifying effective recruitment and retention methods for weight gain prevention trials among young adults.

8. Laska MN, Lytle LA, Nanney MS, Moe SG, Linde JA, Hannan PJ. Results of a 2-year randomized, controlled obesity prevention trial: Effects on diet, activity and sleep behaviors in an at-risk young adult population. *Preventive Medicine*. 2016; 89:230-236.

PMCID: PMC5038135

Excess weight gain tends to occur in young adulthood. However, research examining effective weight-related interventions for this age group has been limited. As one of seven trials in the EARLY Trials consortium (Early Adult Reduction of weight through LifestYle intervention), the CHOICES Study (Choosing Healthy Options in College Environments and Settings) tested effects of a technology-integrated, young adult weight gain prevention intervention. It was a randomized controlled trial with assessments at baseline (2011) and 4-, 12- and 24-months post-intervention initiation and included 441 participants (ages 18-35) who were students at three Minnesota community colleges. The 24-month intervention included a 1-credit academic course and social networking and support online intervention. This analysis examined effects on 12 secondary behavioral outcomes across three domains: diet (fast food, sugary beverages, breakfast, at-home meal preparation), physical activity/screen time (minutes and energy expenditure in leisure time physical activity, television viewing, leisure time computer use) and sleep (hours of sleep, time required to fall asleep, days not getting enough rest, difficulty staying awake). The intervention resulted in significant reductions in fast food ($p=0.007$) but increases in difficulty staying awake ($p=0.015$). There was limited evidence of other behavior changes at 4 months ($0.05 < p < 0.1$) in the expected direction but differences by treatment condition dissipated over time. Analyses examining summary treatment effects (i.e., modeling effects on all behavioral outcomes simultaneously) indicated significant overall effects ($p=0.014$), largely driven by 4-month results ($p=0.005$). Additional research is needed to understand effective obesity prevention among young adults, particularly when addressing multiple weight-related outcomes.

9. Lytle LA, Laska MN, Linde JA, Moe SG, Nanney MS, Hannan PJ, Erickson DJ. Weight-gain reduction among 2-year college students: The CHOICES RCT. *American Journal of Preventive Medicine*. 2017;52(2):183-191.

PMCID: PMC5253254 [Available on 2018-02-01]

The young adult years are recognized as an influential period for excess weight gain, and non-traditional students and those attending 2-year community colleges are at particularly high risk for a range of adverse weight-related outcomes. To evaluate if a 24-month weight gain prevention intervention

reduces the expected increase in body mass index (BMI) and overweight prevalence in young adults attending 2-year colleges, 441 students from three community colleges in Minnesota were recruited into the CHOICES study and randomly assigned into a control or intervention condition after baseline assessment. Two cohorts, corresponding to the fall and spring semesters, were recruited and data collection occurred at four time points for each cohort. Baseline occurred in fall 2011 for cohort 1 and spring 2012 for cohort 2; the 24-month follow-up occurred in fall 2013 for cohort 1 and spring 2014 for cohort 2. Data analysis occurred in 2015-2016. The 24-month intervention began with a 1-credit college course on healthy weight behaviors. A social networking and social support website was introduced as part of the course and participation was encouraged for the duration of the trial. Change in BMI, weight, percent body fat, waist circumference and weight status were assessed. Retention of the cohorts at 24 months was 83.4%. Results showed that while there was not a statistically significant difference in BMI between conditions at the end of the trial, there was a statically significant difference in the prevalence of overweight/obesity between treatment conditions at 24 months. Furthermore, participants randomized to the intervention who were overweight or obese at baseline were more than three times as likely to transition to a healthy weight by the end of the trial as compared to control students. Although the CHOICES intervention was not successful in achieving BMI differences between treatment groups, an eight percent reduction in the prevalence of overweight and obesity over time may have population-level significance.

10. Wallace DD, Boynton MH, Lytle LA. Multilevel Analysis Exploring the Links between Stress, Depression, and Sleep Problems among Two-Year College Students. *Journal of American College Health*. 2017;65(3):187-96. PMID: PMC5373919

This paper explores the association of stress and depression with a multidimensional sleep problem construct in a sample of 440 2-year college students from Fall 2011 to Fall 2013. These obesity prevention study participants (who were primarily women (68%), white (73%), young adults (M age = 22.8) and who slept an average of 8.4 hours per night) completed surveys assessing sleep, stress, and depression at baseline, 4, 12, and 24 months. Multilevel models predicting sleep problems were conducted to distinguish episodic from chronic reports of stress and depression. We learned that neither stress nor depression was predictive of sleep quantity; however, they were predictive of sleep quality. Results showed that sleep quality rather than sleep quantity may be the greater health concern for young adults, suggesting that intervention programs targeting depression, stress management, and healthy sleep patterns are warranted.

11. Jeffries JK, Lytle LA, Sotres-Alvarez D, Golden S, Aiello AE, Linnan L. Chronic Disease Risk Typologies among Young Adults in Community College. *American Journal of Health Behavior*. 2018; 42(2):71-84. PMID: In Process

The aim of this study was to identify subgroups of young adults with respect to their patterns of tobacco and alcohol use, dietary intake, and physical activity behaviors to further understand behavioral chronic disease risk. Results suggested meaningful clusters of lifestyle characteristics occur among young adults. This analysis identified 3 latent classes of modifiable health-related behaviors in young adults in community colleges: (1) active, binge-drinkers with healthy dietary intake (13.1%); (2) non-active, moderate-smokers and non-drinkers with poor dietary intake (38.2%); and (3) moderately active, non-smokers, non-drinkers with a moderately healthy dietary intake (48.7%). These classes differed significantly by age and weight, but contrary to our hypothesis, the classes did not differ by living arrangement. The increased understanding of the prevalence and clustering patterns of multiple health-related behaviors is helpful in identifying subgroups of the population that are at particularly high risk for weight gain based on behavioral patterns. Understanding these typologies may help public health professionals create more effective and efficient interventions in community colleges by targeting certain behaviors or certain contexts to help reduce the onset and improve management of existing chronic diseases.

EARLY Manuscripts Published/In Press (n=1)

1. Lytle LA, Svetkey LP, Patrick K, Belle SH, Fernandez ID, Jakicic JM, et al. The EARLY Trials: A Consortium of Studies Targeting Weight Control in Young Adults. *Translational Behavioral Medicine*. 2014; 4(3):304-313. PMID: PMC4167899

Young adulthood has been identified as a high-risk period for the development of obesity but few interventions have been tested in this population. One way to escalate our learning about effective interventions is to test a number of interventions simultaneously as a consortium of research trials. This paper describes the Early Adult Reduction of weight through LifestYle intervention (EARLY) trials. Seven research sites were funded to conduct intervention trials, agreeing to test similar primary outcomes and cooperating to use a set of common measurement tools. The EARLY consortium was able to work cooperatively using an executive committee, a steering committee, workgroups and subcommittees to help direct the common work and implement a set of common protocol and measurement tools for seven independent but coordinated weight-related intervention trials. Using a consortium of studies to help young adults reach or maintain a healthy weight will result in increased efficiency and speed in understanding the most effective intervention strategies.