

Building a Healthier Workforce: An Evaluation of an Online Nutrition Training for Apprentices

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ABSTRACT

Objective: Construction workers face barriers to healthy eating, including work organization and environmental factors, that can affect productivity and lead to chronic conditions. The objective was to evaluate the effectiveness of an online nutrition training to improve knowledge and behaviors and evaluate the feasibility of conducting this training among apprentices in the highway construction trades.

Methods: A pretest-posttest control group design was used. The intervention was conducted using a Web-based electronic learning platform.

Results: A total of 36 highway construction apprentices (78% male) completed the study. Intervention participants demonstrated improvements in knowledge immediately after the training, reported modest weight loss, decreased body mass index, and decreased fast food consumption compared with control participants. However, increases in knowledge were not seen at follow-up. The training content and format were well-received, indicating that electronic learning approaches were acceptable for this population.

Conclusions and Implications: This project established the acceptability of using an online nutrition training to promote health among apprentices.

Key Words: apprentice, health promotion, nutrition, safety, total worker health (*J Nutr Educ Behav.* 2018;■■:■■-■■.)

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INTRODUCTION

Work organization and work environment can affect diet and subsequently health. The lack of access to healthful food for purchase on or near most construction sites is a structural barrier to a healthy diet. Apprentices and construction workers often travel long distances to worksites and work long days, which can create obstacles to planning, preparing, and eating healthy foods both on and off the job.

Construction workers report low consumption of fruits and vegetables^{1,2} and higher rates of alcohol use³ and smoking.⁴ In the short term, a poor diet can translate to performance and productivity issues. In the long term, a poor diet can lead to a higher prevalence of chronic conditions such as obesity, heart disease, and diabetes.^{5,6} Construction workers have higher rates of mortality and morbidity from chronic diseases and are at increased risk for work injuries and disabilities

compared with workers in white-collar occupations.^{7,8}

Recognizing these barriers to healthy eating and the impact of nutrition on workplace safety, the Oregon Bureau of Labor and Industry (BOLI) partnered with researchers to develop and evaluate an online training addressing nutrition designed for highway construction apprentices (eg, electricians, carpenters, laborers, and operating engineers). Initiatives that expand traditional worker protection programs to include the promotion of health and well-being (ie, Total Worker Health) were shown to be more effective than programs addressing these separately.^{9,10} Faced with limited classroom time for apprentices, an online training that could be completed off-site was developed. The objectives were to evaluate the effectiveness of an online nutrition training to improve knowledge and increase healthy behaviors and to evaluate the acceptability of electronic learning (e-learning) methods to promote safety and health among apprentices in the highway construction trades.

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METHODS

The researchers developed an online, self-paced training; topics included addressing the impact of nutrition on job performance and health, barriers to healthy eating associated with work organizational factors, and solutions to promote healthy eating (Table). The training used peer-to-peer messages, including images and videos featuring apprentices and journeymen on the construction site modeling behaviors, sharing personal stories, and recommending methods to overcome barriers. Information was organized into modules and knowledge checks were required to demonstrate mastery before moving to the next module.¹¹ The training took approximately 50 minutes to complete. The content was reviewed by experts in nutrition, health promotion and occupational safety and health and was pilot-tested by 21 registered apprentices (13 men and 8 women) who provided feedback on the content, delivery format, and duration. This information was used to revise and develop the final training content.

A pretest-posttest control group design was used to evaluate changes in knowledge and behavior. The intervention group completed the nutrition training described earlier and

the control group completed a training addressing positive thinking. Both trainings were delivered through the same online platform. A baseline survey collected demographic information, including questions addressing nutrition knowledge, self-reported behaviors, and attitudes. Immediately after completion of the training, the researchers administered a posttest assessing knowledge. Participants also completed a follow-up survey 12 weeks after they took the training, to assess knowledge retention, behavior changes, and feasibility of e-learning methods (eg, likeability, relevance, and utility). At baseline and the 12-week follow-up, participants were asked to rate their behaviors, attitudes, and intentions toward nutrition and healthy eating on a 7-point agreement scale (1 = strongly disagree to 7 = strongly agree). Seventeen items measured behavior such as *I eat a lot of packaged foods* and *I have at least 1 piece of fruit each day*. Body mass index (BMI) was calculated using self-reported height and weight along with age and gender.

Procedure

Recruitment efforts were led by BOLI and included paper mailings, social media posts, and promotion through BOLI partners. All highway

construction apprentices who renewed or requested an apprenticeship registration between October, 2014 and December, 2014 were sent a flier inviting them to contact the researchers to enroll in the study. Participants were alternately assigned to either the control group (positive thinking training) or intervention group (nutrition training) and were sent a link from the researchers to the online survey and training. Participants had 2 weeks to complete the initial survey and training and 2 weeks to complete the follow-up survey. To achieve maximum participation, 3 reminders were e-mailed to participants who had not yet completed the study activities. Incentives in the form of a \$25 gift card from a local retailer were provided at baseline and follow-up. All study materials and processes were approved by the Oregon Health and Science University Institutional Review Board.

Evaluation of Nutrition Training

The researchers assessed changes to the evaluation metrics between the control (positive thinking training) and intervention groups (nutrition training) from baseline to follow-up at 12 weeks. The following results are reported as effect sizes. A small (0.2), medium (0.5), or large (≥ 0.8) effect size indicates

Table. Topics and Content in Nutrition Training

Topic	Content
Why nutrition matters	Described benefits of a healthy diet related to long-term health and performance on job site
Eating a well-balanced diet	Explained basic components of a healthy diet, including macronutrients, fruit and vegetable recommendations, and MyPlate guidelines ²²
Shopping on a budget	Discussed how to integrate healthy foods into budgeting and shopping
Reading labels	Provided tips on interpreting food packaging (nutrition labels and ingredients list) and identifying healthier food choices
Identifying healthier alternatives	Provided information on how to select healthier options from convenience foods. Workers often travel away from home for long periods or are limited with regard to food preparation opportunities owing to the environmental restrictions of a construction site
Healthy packing and snacking	Described the importance of eating throughout the day to keep a consistent level of energy to remain focused on the task and improve work performance
Hydration	Addressed the importance of drinking enough fluid as it relates to performance and safety on the jobsite and discussed the benefits of avoiding sugary drinks and overconsumption of alcoholic drinks
Food safety	Provided information about hygiene and food storage issues when workers do not have access to refrigeration

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