

Applied Research Brief: Nutrition

Improving Dietary Self-monitoring and Adherence With Hand-held Computers: A Pilot Study

Karen Glanz, PhD, MPH; Suzanne Murphy, PhD, RD; Joanne Moylan, RD, MPH; Diana Evensen, MS; J. David Curb, MD, MPH

Abstract

Purpose. Innovations in information technology offer new opportunities for creative application of personalized, tailored feedback strategies for improving dietary adherence. We developed and tested a real-time diet-monitoring and feedback system using hand-held computers. The goals were to increase diet self-monitoring, reduce the burden of monitoring food intake, and increase adherence to dietary goals within a clinical trial.

Methods. Participants were 33 women in the Diet Modification arm of the Women's Health Initiative (WHI). After using focus groups to determine system features, women used the Personal Digital Assistant (PDA)-based system for 1 month and received immediate and weekly tailored feedback. The process and outcomes were evaluated using real-time food records collected through the PDAs; surveys; and self-reported food frequency questionnaires.

Results. Participants significantly increased self-monitoring, improved their attitudes toward self-monitoring, and met their dietary goals more often. Reported total fat intake and percent energy from fat decreased significantly. There was a modest decrease in mean caloric intake.

Discussion. The pilot study findings support the largely untapped potential of hand-held computers for improving diet monitoring and diet adherence, particularly within a clinical trial. (*Am J Health Promot* 2006;20[3]:165-170.)

Key Words: Dietary Adherence, Hand-Held Computers, Information Technology, Clinical Trials, Prevention Research. Manuscript format: research; Research purpose: intervention development and pilot testing; Study design: pre-post test; Outcome measures: cognitive, behavioral; Setting: clinical trial; Health focus: nutrition; Strategy: self-monitoring and feedback; Target population age: older women; Target population circumstances: Asian-Pacific Islander and White; Honolulu, Hawaii

Karen Glanz, PhD, MPH; Suzanne Murphy, PhD, RD; Joanne Moylan, RD, MPH; and Diana Evensen, MS, are from the Cancer Research Center of Hawaii, University of Hawaii, Honolulu, Hawaii. Karen Glanz, PhD, MPH, is currently affiliated with the Rollins School of Public Health, Emory University, Atlanta, Georgia. Joanne Moylan, RD, MPH, is currently affiliated with Pitt County, North Carolina Health Department. Diana Evensen, MS, is currently affiliated with the Hawaii Center for Health Research, Kaiser Permanente, Honolulu, Hawaii. J. David Curb, MD, MPH, is with the John A. Burns School of Medicine, University of Hawaii at Manoa, Honolulu, Hawaii.

Send reprint requests to Karen Glanz, PhD, MPH, Rollins School of Public Health, Emory University, 1518 Clifton Road, NE, Room 526, Atlanta, GA 30322; kglanz@sph.emory.edu.

This manuscript was submitted April 21, 2004; revisions were requested January 14, 2005, and March 14, 2005; the manuscript was accepted for publication March 20, 2005.

Copyright © 2006 by American Journal of Health Promotion, Inc.
0890-1171/06/\$5.00 + 0

Nutrition is a key influence on major chronic diseases and mortality. High intake of dietary fat, especially saturated fat, is associated with increased risk of several chronic diseases; and adequate intake of fruits, vegetables, and fiber-rich grains appears to have protective effects.^{1,2}

The federally funded Women's Health Initiative (WHI) is the largest multicenter trial to date of dietary means for prevention, with over 48,000 women in the Diet Modification Trial within WHI.³ In the Diet Modification Intervention arm of the trial, participants are taught and advised to follow a diet that is low in fat and high in fruits, vegetables, and grains for up to 10 years. Because adherence is a critical concern in WHI, it is important to continually try to identify new, efficacious adherence-improving strategies.

Interventions that use personalized, or tailored, feedback hold great promise for promoting health behavior change^{4,5} and have been effective in improving nutrition.^{6,7} Innovations in information technology make possible new, creative applications of tailored strategies for improving adherence.⁸⁻¹⁰ Hand-held computers enable real-time recording and immediate, automated feedback, thus increasing both the timeliness and accuracy of self-monitoring to improve adherence.

We report here on a pilot study that developed and tested a real-time diet monitoring and feedback system using hand-held computer technology, or Personal Digital Assistants (PDAs). Participants were women in the Diet Modification (DM) arm of