*Research Article*

# The Personal Nutrition Planner: A 5-Week, Computer-tailored Intervention for Women

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## ABSTRACT

**Objective:** To conduct a dietary intervention using the Personal Nutrition Planner (PNP), an on-line nutrition intervention tool.

**Design:** Randomized controlled trial with pretest, posttest, and 2-month follow-up self-report assessments.

**Setting:** Web/on-line.

**Participants:** Female university staff (n = 307; 59.1% Caucasian) recruited via e-mail. Retention rate was 85.0% (118 treatment; 143 comparison).

**Intervention:** PNP on-line produces individualized nutrition feedback based on initial on-line assessment. Intervention lasted 5 weeks and included weekly e-mail reminders.

**Main Outcome Measures:** Dietary intake frequencies, weight loss, opinions regarding intervention.

**Analysis:** Repeated-measures analysis of variance to determine intervention effects on dietary intake and weight loss ($P < .05$).

**Results:** Relative to the comparison group who received no program, the treatment group increased dairy intake frequency across the 3 assessments ($F_{2,304} = 3.15$; $P < .05$). Among participants who wanted to lose weight, weight loss in the treatment group was significantly higher than that of the comparison group from pretest to posttest ($F_{1,92} = 4.50$; $P < .05$). On a scale of 1-5, mean ratings of the PNP program characteristics ranged from 3-4.

**Conclusions and Implications:** PNP produced significant increases in dairy intake and decreases in weight. Further revisions will tailor PNP to better fit individuals' dietary goals and increase motivation.

**Key Words:** diet, intervention studies, women, on-line systems, nutrition education (*J Nutr Educ Behav*. 2011;43:165-172.)

## INTRODUCTION

The most popular sources of nutrition information have gradually shifted from television and magazines to the Internet.[1] On-line nutrition interventions implemented in the general adult population,[2,3] among young adults,[4] in working-class neighborhoods,[5] in workplace settings,[6-9] in rural communities,[10] at churches,[11] and even in middle school settings[12] have been well accepted. Participants with access to a computer can obtain individually tailored nutrition recommendations that are based on an initial, self-reported on-line assessment. Relative to in-person interventions, on-line interventions are more accessible to the general adult population,[2,5] those with a chronic condition and higher health-related costs,[13] and those with longer travel times to their usual source of care.[14]

Compared to traditional educational materials such as pamphlets and brochures, computer-tailored interventions are more often read entirely[6] and increase participants' awareness that they overconsume high-fat food and underconsume fruits and vegetables.[3,6] Positive intervention effects were found in 20 of 26 randomized controlled trials of computer-tailored nutrition interventions reviewed, with reduced fat intake being the most consistent outcome.[2] Other outcomes include increased fruit and vegetable intake[2,10,15] and intention to change dietary behaviors.[3,7] However, other studies report that computer-tailored interventions have had limited success in reducing overweight and obesity.[16-18] This is the first study to examine intervention effects of the Personal Nutrition Planner (PNP), specifically regarding dietary intakes and weight loss.

The PNP is an intervention Web page that is a component of a larger nutrition and physical activity Web site.[19] The PNP was developed in 1998 by registered dietitians to offer free, computer-tailored nutrition and health information consistent with the United States Department of Agriculture MyPyramid food guidance system,[20] and it is tailored for adults with at least a high school level of education who are familiar with using the

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Internet. The PNP targets specific constructs of Social Cognitive Theory (SCT).[21] The PNP has its own self-reported on-line assessment, from which participants' body mass index and estimated energy expenditure are calculated, and it then provides participants with the MyPyramid recommended amounts for all food groups.[20] The participant also receives specific nutrition information based on the participant's age, sex, level of activity, and weight goals, as well as information on how nutrients in each food group benefit health. This feedback addresses the SCT construct of knowledge.

Participants then choose from a list of long-term goals (eg, lose weight, reduce risk of future chronic disease) or type in a personalized goal, and they identify a short-term action they will undertake for the next 7 days (eg, prepare more meals at home, reduce portion sizes). Identifying realistic short-term goals is a strategy to increase the SCT concept of self-efficacy. To increase facilitators for behavior change (facilitators is an SCT construct), the PNP Web site contains a shopping list to identify food items within each food group participants would like to add to their diet, and a meal planner. Registration is required so participants can review their profile at a later date and to receive follow-up e-mail newsletters. The newsletters contain personalized information (eg, a reminder of an individual's goal, shopping-list items), and information that is relevant to a broader audience (eg, suggestions for overcoming common pitfalls when changing health behaviors, culturally diverse recipe ideas, and meal-planning tips). The PNP has been updated several times to match evolving nutrition recommendations, such as changing the Food Guide Pyramid recommendations to the MyPyramid recommendations.

Similar to the PNP, the "Women's Fitness Planner" is an Internet-based intervention with an e-mail reminder component that is a component of the Meals Matter Web site, but with a focus on physical activity. A study indicated that ethnically diverse women participating in the "Women's Fitness Planner" significantly increased their walking and moderate-to-vigorous physical activity at 3-month follow-up relative to baseline and compared to a waitlisted control group.[22] The present study is a randomized controlled trial of the PNP among women, with a focus on dietary intakes (frequency of dairy, fruit, and vegetable intake) and weight loss (from pretest to posttest). The treatment group received the PNP intervention, whereas the comparison group received no intervention.

## METHODS

### Participants

Participants were female staff members at 2 southern California universities who were recruited through an e-mail advertisement. E-mails were sent to over 4,000 individuals whose e-mail addresses appeared in the university's global address list as university staff members. Male recipients were instructed that they could forward the e-mail to their female coworkers. Female university staff members were an ideal sample for this study because females are more susceptible to obesity,[23] and the majority of university employees have access to the Internet access either at work or at home. Interested participants replied to the e-mail and then completed a brief screening tool to determine eligibility for the study; eligible participants were included in a cohort. Inclusion criteria were the following: 21-65 years old, not pregnant, not on a vegan diet, and have Internet access to check e-mails on a weekly basis.

Study recruitment occurred between January and May 2008, and data collection for the entire study was completed by October 2008. Participants were recruited by mass emails in 4 successive, overlapping cohorts. Having multiple cohorts allowed participants to begin the study at different times according to when they were recruited and screened.

A total of 307 women completed the pretest survey, which occurred prior to random assignment to either comparison or treatment groups. Of these, 153 and 154 women were then assigned to the comparison and treatment groups, respectively. A total of 275 (n = 128 treatment and n = 147 comparison) completed the posttest survey, which occurred immediately after the treatment group's completion of the PNP, and 261 (85.0%; n = 118 treatment and n = 143 comparison) completed the 2-month posttest survey. With the exception of ethnicity (more Caucasians in the comparison group, $P < .05$), there were no significant differences between the treatment and comparison groups on all other demographic variables assessed. Overall, the random assignment procedure was successful, and subsequent analyses adjusted for ethnicity.

### Statistical Power

A priori effect size estimations were based on the hypothesis that included the smallest sample size, specifically, intervention effects on weight loss only among those who wanted to lose weight. The sample size of 54 in the treatment group and 41 in the comparison group provided the authors with the ability to detect, with power = 80%, $P < .05$, and an effect size of approximately 0.52. This result corresponds to slightly larger than a "medium" effect size.[24]

### Study Design and Implementation

All study procedures received prior approval by the Institutional Review Board of California State University–Fullerton. Random assignment to the treatment and comparison groups occurred 1 week after the deadline for completing the pretest survey. The treatment group participants received an e-mail instructing them to: (1) register on the Meals Matter Web site; (2) complete the PNP; and (3) indicate whether or not they would like to receive 4 weekly e-mail reminders of their PNP goals and steps and obtain additional information. The on-line enrollment takes approximately 5 minutes to complete. The PNP contains links that lead to outside content, including a fitness planner, and food pantry information and recipes to promote healthful eating and facilitate their short-term (7-day) goal. Of the 128 treatment group participants who completed a posttest survey, 101 completed registration and therefore could view their profile at a later time. As such, the