

Applied Research Brief: Weight Control

A Multicomponent Intervention Reduces Body Weight and Cardiovascular Risk at a GEICO Corporate Site

Hope R. Ferdowsian, MD, MPH; Neal D. Barnard, MD; Valerie J. Hoover, BA; Heather I. Katcher, PhD, RD; Susan M. Levin, MS, RD; Amber A. Green, RD; Joshua L. Cohen, MD

Abstract

Purpose. To determine whether a multicomponent nutrition intervention program at a corporate site reduces body weight and improves other cardiovascular risk factors in overweight individuals.

Design. Prospective clinical intervention study.

Subjects/Setting. Employees of the Government Employees Insurance Company (GEICO) ($N = 113$), aged 21 to 65 years, with a body mass index ≥ 25 kg/m² and/or previous diagnosis of type 2 diabetes.

Intervention. A 22-week intervention including a low-fat, vegan diet.

Measures. Changes in body weight, anthropometric measures, blood pressure, lipid profile, and dietary intake.

Analysis. Multivariate analyses of variance were calculated for clinical and nutrient measures, followed by univariate analyses of variance, to determine the significance of differences between groups in changes over time.

Results. Intervention-group participants experienced greater weight changes compared with control-group participants (mean, -5.1 [SE, $.6$] kg vs. $+ .1$ [SE, $.6$] kg, $p < .0001$), as well as greater changes in waist circumference (mean, -4.7 [SE, $.6$] cm vs. $+ .8$ [SE, $.6$] cm, $p < .0001$) and waist:hip ratio (mean, $-.006$ [SE, $.003$] vs. $+ .014$ [SE, $.005$], $p = .0007$). Weight loss of 5% of body weight was more frequently observed in the intervention group (48.5%) compared with the control group (11.1%) ($\chi^2[1, N = 113] = 16.99, p < .0001$).

Conclusions. Among individuals volunteering for a 22-week worksite research study, an intervention using a low-fat, vegan diet effectively reduced body weight and waist circumference. (*Am J Health Promot* 2010;24[6]:384–387.)

Key Words: Overweight, Body Weight, Nutrition, Workplace, Vegetarian, Prevention Research. Manuscript format: research; Research purpose: intervention testing; Study design: quasi-experimental; Outcome measure: behavioral, biometric, absenteeism; Setting: workplace; Health focus: nutrition; Strategy: education, behavior change; Target population age: adults; Target population circumstances: health status

Hope R. Ferdowsian, MD, MPH, is Clinical Instructor; Neal D. Barnard, MD, is Adjunct Associate Professor; and Joshua L. Cohen, MD, is Associate Professor of Medicine, Department of Medicine, The George Washington University School of Medicine, Washington, DC. Hope R. Ferdowsian, MD, MPH, is Associate Director; Neal D. Barnard, MD; Valerie J. Hoover, BA; Heather I. Katcher, PhD, RD; Susan M. Levin, MS, RD; and Amber A. Green, RD, are with the Washington Center for Clinical Research, Washington, DC. Hope R. Ferdowsian, MD, MPH, is Staff Physician, Unity Health Care, Inc, Washington, DC.

Send reprint requests to Hope R. Ferdowsian, MD, MPH, Associate Director, Washington Center for Clinical Research, 5100 Wisconsin Ave, NW, Suite 400, Washington, DC 20016; hferdowsian@washingtonccr.org.

This manuscript was submitted October 27, 2008; revisions were requested January 28 and March 5, 2009; the manuscript was accepted for publication March 6, 2009.

Copyright © 2010 by American Journal of Health Promotion, Inc.
0890-1171/10/\$5.00 + 0
DOI: 10.4278/ajhp.081027-QUAN-255

PURPOSE

Approximately 65% of Americans are overweight, increasing their risk for diabetes, hypertension, and cardiovascular disease. Annual costs of obesity-related expenditures to businesses have been estimated at approximately \$13 billion, including those attributable to health insurance, life and disability insurance, and sick leave costs.¹ Employers may be motivated to provide obesity-related interventions, because they often assume financial liability for health outcomes and costs.¹

Epidemiologic studies have shown that populations consuming low-fat, plant-based diets have a low prevalence of overweight and obesity.² In randomized trials, low-fat, plant-based diets reduce body weight, improve plasma lipid concentrations, reverse coronary atherosclerosis, and improve type 2 diabetes management.^{3,4}

Acceptability of low-fat, vegetarian, and vegan diets has been shown to be comparable to that of other therapeutic diets.⁵ Several studies also demonstrated the sustainability of low-fat vegetarian⁶ and vegan⁷ diet interventions. However, there is less evidence on how efficacious dietary interventions can be applied outside the research environment.

In a prospective study, we examined the effectiveness of a worksite nutrition program including a low-fat, vegan diet on body weight, plasma lipid concentrations, blood pressure, work absenteeism, and, in individuals with diabetes, glycemic control, measured by hemoglobin A1c.

Table 1
Macronutrient Changes by Group Assignment

	Intervention Group (n = 68)		Control Group (n = 45)		Between-Group <i>p</i>
	Baseline Mean (SD)	22-wk Mean (SD)	Baseline Mean (SD)	22-wk Mean (SD)	
Energy, kcal	1854.4 (588.5)	1471.5 (480.1)*	1721.4 (543.9)	1581.4 (552.5)	0.017
Protein, % total energy	15.9 (3.2)	13.9 (3.4)†	17.4 (3.9)	17.5 (4.4)	0.013
Carbohydrate, % total energy	49.1 (8.7)	67.4 (10.8)*	47.6 (8.6)	48.1 (10.6)	<0.0001
Total fat, % total energy	35.4 (7.8)	21.2 (7.9)*	36.0 (7.0)	35.8 (8.6)	<0.0001
Saturated fat, % total energy	10.9 (3.4)	4.7 (3.0)*	11.9 (2.8)	11.8 (3.5)	<0.0001
Fiber, g	18.4 (8.2)	28.5 (12.5)*	15.0 (6.4)	15.1 (8.8)	<0.0001

* Difference within group, *p* < 0.0001.

† Difference within group, *p* = 0.001.

METHODS

Sample

Individuals with a body mass index (BMI) ≥ 25 kg/m² and/or previous diagnosis of type 2 diabetes were recruited at the Government Employees Insurance Company (GEICO). The corporate site in Chevy Chase, Maryland, and the corporate site in Fredericksburg, Virginia, were designated the intervention and control sites, respectively. Exclusion criteria included a history of unresolved alcohol or drug abuse or dependency; pregnancy; history of severe mental illness; unstable medical status; current use of a low-fat, vegetarian diet; or an A1c $>10.5\%$. Of 170 (76 at the intervention site; 94 at the control site) individuals screened, 68 (18 male, 50 female) at the intervention site and 45 (2 male, 43 female) at the control site met participation criteria and were enrolled in the study. The protocol was approved by an external institutional review board and all participants provided written informed consent.

Design

At the intervention site, participants were asked to follow a low-fat vegan diet for 22 weeks, as described previously.³ Intervention-group participants were asked to take a daily multiple vitamin to meet vitamin B₁₂ requirements and to monitor their weight weekly at the medical services office.

Group meetings consisted of either a 20- to 30-minute presentation followed by group discussion or a 45-minute cooking demonstration, and were led by a physician, a registered dietitian, and/or a cooking instructor. Participants were

also provided with practical tools, including an interactive message board and grocery store tour. The company cafeteria offered low-fat vegan options daily.

At the control site, no educational sessions were provided, and participants were asked to continue their habitual diets. Control-group participants were compensated with gift certificates (totaling \$60 per participant) and informed that the nutrition program would be provided upon study completion. Participants in both groups were asked not to alter their exercise habits during the intervention period.

Measures

In order to assess adherence, a dietitian made unannounced telephone calls at weeks 2, 8, and 16 to intervention-group participants to administer a 24-hour diet recall. All participants also completed a 3-day diet record at weeks 0 and 22, which was analyzed using Nutrition Data System for Research software version 2007.

An adherence score ranging from 0 to 5 was calculated as the number of adherence criteria met by each participant. The adherence criteria were defined as: (1) the absence of meat, poultry, fish, dairy, and egg intake reported on 24-hour recalls and 3-day diet records; (2) saturated fat $<5\%$ of energy, (3) total fat $<25\%$ of energy, and (4) average daily cholesterol intake <50 mg on 3-day dietary records at 22 weeks; and (5) attending >10 weekly sessions.

Body weight, waist and hip circumference, and blood pressure were assessed at baseline and week 22. A fasting blood sample was also taken to measure plasma lipid concentrations

and A1c concentrations in participants with type 2 diabetes.

Participants were questioned monthly about the number of hours they were absent from work because of health problems.

Analysis

Multivariate analyses of variance (MANOVAs) and χ^2 analyses were performed for continuous and ordinal measures, respectively, to determine whether baseline characteristics differed between groups. To determine whether changes in the intervention group differed from those in the control group, MANOVAs were calculated separately for clinical and for nutrient measures, followed by univariate analyses of variance. Paired *t*-tests were calculated to test for within-group changes. Chi-square analysis was performed to determine whether there were differences between groups for weight loss of $\geq 5\%$ of body weight. Regression analyses assessed whether weight loss was predicted by baseline weight, gender, age, dietary adherence, meeting attendance, frequency of weigh-ins, and changes in total fat and fiber intake.

An α of .05 was used for the statistical tests. To minimize the likelihood of a type I error for within-group comparisons, α of .01 was used. Statistical analyses were performed using SAS version 8.2.

RESULTS

Sixty-five of 68 (96%) intervention-group participants and 44 of 45 (98%) control-group participants completed anthropometric and laboratory assessments at 22 weeks. Reasons for failure to

Table 2
Changes in Clinical Variables by Group Assignment

Clinical Measure	Intervention (n = 68)*			Control (n = 45)*			Between-Group Difference (Intervention – Control), Mean (95% CI)	p
	Baseline	22 wk	Within-Group Difference	Baseline	22 wk	Within-Group Difference		
Weight, kg	98.7 (2.8)	93.6 (2.7)	–5.1 (0.6)†	100.1 (3.5)	100.3 (3.7)	0.1 (0.6)	–5.3 (–7.0 to –3.5)	<0.0001
Waist circumference, cm	110.3 (1.9)	105.5 (1.9)	–4.7 (0.6)†	110.2 (2.7)	111.0 (2.8)	0.8 (0.6)	–5.5 (–7.3 to –3.7)	<0.0001
Hip circumference, cm	123.1 (1.7)	118.6 (1.8)	–4.5 (0.5)†	127.0 (2.4)	125.8 (2.4)	–1.2 (0.6)	–3.3 (–4.8 to –1.8)	<0.0001
Waist:hip, cm	0.895 (0.009)	0.889 (0.009)	–0.006 (0.003)	0.866 (0.011)	0.880 (0.011)	0.014 (0.005)‡	–0.020 (–0.031 to –0.009)	0.0007
Cholesterol								
Total, mg/dL	186.8 (4.6)	177.1 (4.7)	–9.8 (3.6)§	183.9 (5.0)	182.3 (5.4)	–1.6 (3.5)	–8.1 (–18.6 to +2.3)	0.13
No med changes	188.2 (4.9)	177.2 (5.0)	–11.0 (3.8)‡	184.1 (5.1)	182.4 (5.6)	–1.7 (3.6)	–9.3 (–20.1 to +1.6)	0.09
LDL, mg/dL	103.5 (3.9)	99.1 (4.0)	–4.4 (3.3)	106.7 (4.1)	105.3 (4.6)	–1.4 (3.2)	–3.0 (–12.5 to +6.4)	0.53
No med changes	104.4 (4.1)	99.2 (4.2)	–5.2 (3.5)	106.8 (4.2)	105.4 (4.7)	–1.4 (3.2)	–3.7 (–13.6 to +6.1)	0.45
HDL, mg/dL	52.7 (1.6)	48.3 (1.6)	–4.3 (0.8)†	50.9 (2.1)	50.5 (2.3)	–0.4 (0.9)	–3.9 (–6.4 to –1.5)	0.002
No med changes	52.5 (1.6)	48.0 (1.6)	–4.5 (0.9)	50.8 (2.1)	50.4 (2.4)	–0.4 (0.9)	–4.1 (–6.6 to –1.6)	0.001
Triglycerides, mg/dL	154.2 (11.8)	149.8 (10.9)	–4.4 (6.5)	131.6 (9.2)	135.2 (13.1)	3.5 (10.1)	–7.9 (–30.5 to +14.7)	0.49
No med changes	157.6 (12.4)	152.0 (11.5)	–5.6 (6.9)	132.4 (9.4)	136.0 (13.4)	3.6 (10.3)	–9.2 (–32.8 to +14.4)	0.44
Blood pressure, mmHg								
Systolic	118.8 (1.7)	118.8 (1.7)	0 (1.4)	116.4 (1.6)	122.1 (2.5)	5.7 (2.2)¶	–5.7 (–10.6 to –0.9)	0.03
No med changes#	117.9 (1.7)	117.6 (1.8)	–0.3 (1.3)	115.6 (1.7)	122.3 (2.9)	6.6 (2.3)	–6.9 (–11.8 to –2.0)	0.01
Diastolic	80.5 (1.2)	80.1 (1.1)	–0.4 (1.1)	78.4 (1.3)	83.5 (1.5)	5.1 (1.2)**	–5.6 (–9.0 to –2.2)	0.002
No med changes#	79.8 (1.2)	78.9 (1.1)	–0.9 (1.2)	77.9 (1.4)	83.2 (1.7)	5.3 (1.3)	–6.2 (–9.8 to +2.6)	0.001
Hemoglobin A1c, %††	7.4 (0.3)	7.1 (0.5)	–0.3 (0.6)	7.0 (0.4)	6.7 (0.4)	–0.3 (0.2)	0 (–1.4 to +1.4)	0.97
No med changes‡‡	7.8 (0.5)	6.8 (0.2)	–1.0 (0.4)	6.3 (0.2)	6.1 (0.1)	–0.2 (0.1)	–0.7 (–1.6 to 0.1)	—

NOTE: Data are presented as mean (SE) unless otherwise indicated. CI indicates confidence interval; LDL, low-density lipoprotein; and HDL, high-density lipoprotein.

* n unless otherwise indicated.

† Change within group between baseline and 22 weeks, $p < 0.0001$.

‡ Change within group between baseline and 22 weeks, $p = 0.006$.

§ Change within group between baseline and 22 weeks, $p = 0.009$.

¶ Change within group between baseline and 22 weeks, $p = 0.01$.

|| No change in antihyperlipidemic medications between baseline and 22 weeks; intervention group $n = 63$, control group $n = 44$.

No change in antihypertensive medications between baseline and 22 weeks; intervention group $n = 59$, control group $n = 38$.

** Change within group between baseline and 22 weeks, $p = 0.0001$.

†† Participants with diabetes; intervention group $n = 10$, control group $n = 9$.

‡‡ Participants with diabetes with no change in diabetes medications between baseline and 22 weeks; intervention group $n = 5$, control group = 6 (n too small for statistical tests).

complete the study included medical problems unrelated to the intervention ($n = 1$), work relocation ($n = 1$), and family health issues ($n = 1$) in the intervention group, and personal issues ($n = 1$) in the control group. In addition, 3 intervention-group participants and 1 control-group participant failed to complete 22-week dietary records. No significant differences were found between groups for any clinical measures at baseline, but there were differences for age ($p = .05$), gender ($p = .003$), and race ($p = .03$). There were no treatment-related serious adverse events.

Dietary Intake and Adherence

At baseline, there were no significant group differences in macronutrient in-

take, although there were small differences in fiber intake (Table 1). Both groups reduced energy intake, although the change was not statistically significant in the control group. Total fat, saturated fat intake, and protein intake fell in the intervention group, whereas carbohydrate and fiber intake increased. There were no significant changes in these variables in the control group.

All adherence criteria were met by 30 of 68 (44%) of intervention-group participants. Complete abstention from animal products was reported by 57% of participants; 72% met the adherence criteria for saturated and total fat intake, 79% met the criterion for cholesterol intake, and 71% met the meeting attendance criterion.

Weight and Anthropometric Variables

Body weight decreased a mean (\pm SE) of $5.1 \pm .6$ kg in the intervention group and increased $.1 \pm .6$ kg in the control group ($p < .0001$; Table 2). BMI decreased 2.0 kg/m² in the intervention group, compared with no change in the control group. Weight loss of $\geq 5\%$ of body weight was more frequent in the intervention group (48.5%) compared with the control group (11.1%; $\chi^2(1, N = 113) = 16.99, p < .0001$). Waist and hip circumference and waist:hip ratio decreased significantly more in the intervention group compared with the control group.

The regression model predicting weight change at 22 weeks was signif-

icant, $F(8, n = 65) = 3.94, p = .002, R^2 = .35$. In separate regression models controlling for baseline weight, dietary adherence ($p = .0005$) and the number of weigh-ins ($p < .0001$) were significant predictors of weight loss. Dietary adherence and the number of weigh-ins were highly correlated ($r = .73, p < .001$). Gender, age, meeting attendance, and changes in total fat and fiber intake were not significant predictors of weight loss.

Blood Pressure and Lipid Concentrations

Total and low-density lipoprotein (LDL) cholesterol decreased to a greater extent in the intervention group (-9.8 ± 3.6 and -4.4 ± 3.3 mg/dL) compared with the control group (-1.6 ± 3.5 and -1.4 ± 3.2 mg/dL); however, the difference did not reach statistical significance. High-density lipoprotein (HDL) cholesterol decreased in the intervention group compared with the control group ($-4.3 \pm .8$ vs. $-.4 \pm .9$ mg/dL, $p = .002$). Systolic and diastolic blood pressure did not change in the intervention group, but rose by approximately 5 mmHg in the control group.

Glycemic Outcomes in Participants with Type 2 Diabetes

Among individuals with type 2 diabetes, A1c decreased by .3% in both the intervention ($n = 10$) and control ($n = 9$) groups ($p = .97$). Among individuals without medication changes, A1c decreased by 1.0% in the intervention group ($n = 5$) and by .2% in the control group ($n = 6$). Diabetes status was not a predictor of weight loss.

Absenteeism

Absenteeism was similar between the intervention ($N = 61$) and control ($N = 40$) groups (2.6 ± 1.1 vs. $2.4 \pm .7$ h/mo, $p = .89$) at baseline. Over 22 weeks, the intervention group reported a mean of 16.7 ± 2.5 hours of work loss because of health problems, compared with 22.8 ± 3.6 hours in the control group ($p = .17$).

DISCUSSION

Summary

In this study of a dietary intervention among overweight individuals in a corporate setting, participants in the intervention program lost significantly more weight and had a greater reduction in

waist and hip circumference compared with an untreated control group. Moderate weight loss, as seen in our study, has been associated with reduced cardiovascular risk and mortality.^{8,9}

Previous studies have demonstrated the efficacy of low-fat, vegan diets in promoting weight loss and improving cardiovascular risk factors.^{3,4} Plant-based diets promote weight loss and improved lipids through their low saturated fat, low cholesterol, low calorie, and high fiber content. A decrease in HDL cholesterol, as we observed, is common with weight loss, and HDL cholesterol will likely increase if weight loss is maintained.¹⁰ The lack of significant changes in blood pressure and LDL cholesterol may be because of low levels at baseline and short study duration.

Complete adherence to a vegan diet was observed in about half of participants. Dietary deviations in the remaining participants were minor in many cases, and their dietary patterns were still quite distinct from those at baseline. Both dietary adherence and the number of weigh-ins were significant predictors of weight loss. Because dietary adherence and the number of weigh-ins were highly correlated, it is not possible to determine whether one was a stronger determinant of weight loss. It is likely that both actions reinforced each other and facilitated weight loss.

This study's strengths include the use of a multicomponent intervention, high rate of completion, translational design, and inclusion of outcomes that pertain to worksite costs. The high rate of completion was likely because of the combination of a supportive group environment, health information provided by medical professionals, interactive activities such as cooking demonstrations, and a centralized location.

Limitations

Limitations include the use of self-selected volunteers, relatively short duration, and no collection of physical activity data. Medication adjustments affected some analyses of secondary outcomes.

Significance

Although important principles for improving obesity, diabetes, and cardiovascular disease have been identified in research studies, it is crucial to explore means of translating these

principles in settings where people live and work. This study demonstrates the feasibility of introducing a vegan diet program using minimal group support and simple cafeteria items within a large corporate setting. This study also demonstrates that a dietary intervention, using a low-fat, vegan diet, can foster improvements in health for employees and potential benefits for the employer in the form of healthier employees. Future research should include long-term, randomized controlled studies, to further establish the effectiveness of the intervention in producing sustainable results to employers and employees.

Acknowledgments

The authors wish to acknowledge Paul Poppen, PhD, at The George Washington University for statistical support, and study staff that provided administrative and technical support, including Jill Eckart, CHHC; Trulie Ankerberg-Nobis, MS, RD; Patricia G. Slowik; Angela Henley; and Ximena Savitch. The study was funded by the Washington Center for Clinical Research (study NCT00481897, more information available at www.clinicaltrials.gov).

References

1. Thompson D, Edelsberg J, Kinsey KL, Oster G. Estimated economic costs of obesity to US business. *Am J Health Promot.* 1998;13:120-127.
2. Key TJ, Davey GK, Appleby PN. Health benefits of a vegetarian diet. *Proc Nutr Soc.* 1999;58:271-275.
3. Barnard ND, Cohen J, Jenkins DJ, et al. A low-fat vegan diet improves glycemic control and cardiovascular risk factors in a randomized clinical trial in individuals with type 2 diabetes. *Diabetes Care.* 2006;29:1777-1783.
4. Ornish D, Brown SE, Scherwitz LW, et al. Can lifestyle changes reverse coronary heart disease? The Lifestyle Heart Trial. *Lancet.* 1990;336:129-133.
5. Barnard ND, Scialli AR, Bertron P, et al. Acceptability of a therapeutic low-fat, vegan diet in premenopausal women. *J Nutr Educ.* 2000;32:314-319.
6. Ornish D, Scherwitz LW, Billings JH, et al. Intensive lifestyle changes for reversal of coronary heart disease. *JAMA.* 1998;280:2001-2007.
7. Turner-McGrievy GM, Barnard ND, Scialli AR. A two-year randomized weight loss trial comparing a vegan diet to a more moderate low-fat diet. *Obesity (Silver Spring).* 2007;15:2276-2281.
8. Van Gaal LF, Wauters MA, De Leeuw IH. The beneficial effects of modest weight loss on cardiovascular risk factors. *Int J Obes Relat Metab Disord.* 1997;21(suppl 1):S5-S9.
9. Pamuk ER, Williamson DF, Madans J, et al. Weight loss and mortality in a national cohort of adults, 1971-1987. *Am J Epidemiol.* 1992;136:686-697.
10. Dattilo AM, Kris-Etherton PM. Effects of weight reduction on blood lipids and lipoproteins: a meta-analysis. *Am J Clin Nutr.* 1992;56:320-328.

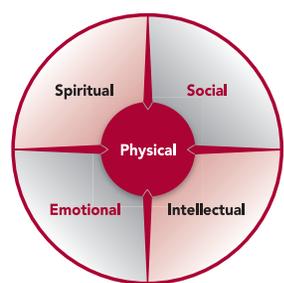
Online
subscriptions
now available

Volume 24, Number 4
March/April 2010

Your Best Source for the Latest Research and Best Practices in Health Promotion

Definition of Health Promotion

“Health Promotion is the art and science of helping people discover the synergies between their core passions and optimal health, enhancing their motivation to strive for optimal health, and supporting them in changing their lifestyle to move toward a state of optimal health. Optimal health is a dynamic balance of physical, emotional, social, spiritual, and intellectual health. Lifestyle change can be facilitated through a combination of learning experiences that enhance awareness, increase motivation, and build skills and, most important, through the creation of opportunities that open access to environments that make positive health practices the easiest choice.”



DIMENSIONS OF OPTIMAL HEALTH

(O'Donnell, *American Journal of Health Promotion*, 2009, 24,1,iv)

“The *American Journal of Health Promotion* provides a forum for that rare commodity — *practical and intellectual exchange between researchers and practitioners.*”

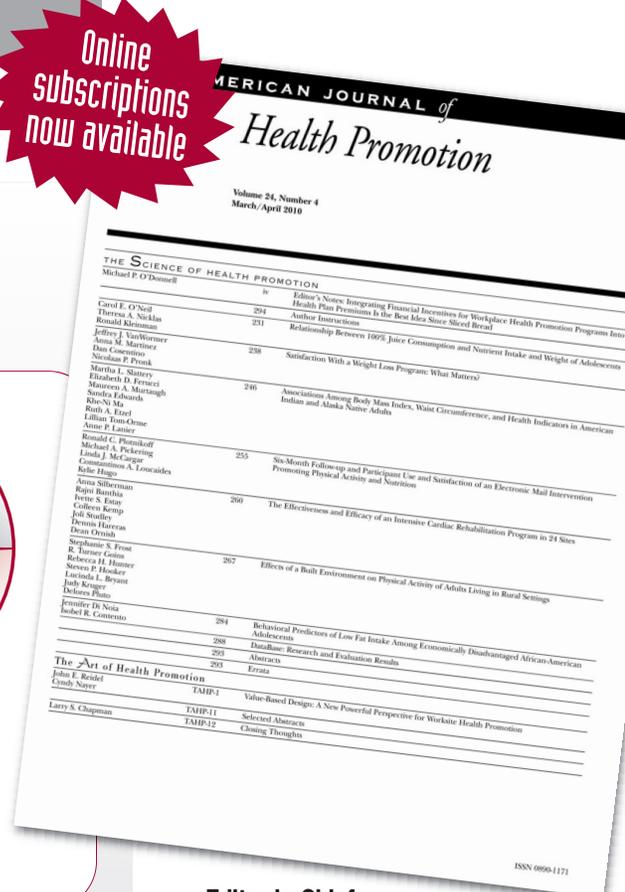
Kenneth E. Warner, PhD

*Dean and Avedis Donabedian Distinguished University Professor of Public Health
School of Public Health, University of Michigan*

“The contents of the *American Journal of Health Promotion* are *timely, relevant*, and most important, *written and reviewed by the most respected researchers in our field.*”

David R. Anderson, PhD, LP

Senior Vice President & Chief Health Officer, StayWell Health Management



Subscribe today...

ANNUAL SUBSCRIPTION RATES: (Available 1/1/10. Good through 12/31/10)

	INDIVIDUAL		INSTITUTION	
	Print & Online	Print	Online	Print & Online
U.S.	\$139	\$177	\$359	\$359
Canada and Mexico	\$148	\$186	\$359	\$368
Other Countries	\$157	\$195	\$359	\$377

Call 800-783-9913 (U.S. only) or 818-760-8520

Check out our new online format:

<http://www.HealthPromotionJournal.com/online.htm>

Editor in Chief

Michael P. O'Donnell, PhD, MBA, MPH

Associate Editors in Chief

- Margaret Schneider, PhD
- Jennie Jacobs Kronenfeld, PhD
- Shirley A. Musich, PhD
- Kerry J. Redican, MPH, PhD, CHES

SECTION EDITORS

Interventions

- Fitness*: Barry A. Franklin, PhD
- Medical Self-Care*: Lucy N. Marion, PhD, RN

Nutrition

- Karen Glanz, PhD, MPH

Smoking Control

- Michael P. Eriksen, ScD

Weight Control

- Kelly D. Brownell, PhD

Stress Management

- Cary Cooper, CBE

Mind-Body Health

- Kenneth R. Pelletier, PhD, MD (hc)

Social Health

- Kenneth R. McLeroy, PhD

Spiritual Health

- Larry S. Chapman, MPH

Strategies

Behavior Change

- James F. Prochaska, PhD

Culture Change

- Daniel Stokols, PhD

Population Health

- David R. Anderson, PhD, LP

Applications

Underserved Populations

- Antronette K. (Toni) Yancey, MD, MPH

Health Promoting Community Design

- Bradley J. Cardinal, PhD

The Art of Health Promotion

- Larry S. Chapman, MPH

Research

Data Base

- Troy Adams, PhD

Financial Analysis

- Ron Z. Goetzel, PhD

Measurement Issues

- Shawna L. Mercer, MSc, PhD