



A Plant-Based Nutrition Program

Nurses experience the benefits and challenges of following a plant-based diet.

ABSTRACT: Proper nutrition is an important but often overlooked component of preventive care and disease management. Following a plant-based diet in particular has been shown to have dramatic effects on health and well-being in a relatively short period of time. For this reason, nurses at three faculty-led community health clinics participated in a nutrition educational program, following a plant-based diet for 21 days. They sought to improve their knowledge of plant-based nutrition and experience firsthand the benefits of such a diet. The authors conclude that this type of program, with its experiential component and beneficial personal health results, has the potential to influence a larger nursing audience as participants apply their knowledge and experience to patient care and to classroom discussions with nursing students.

Keywords: health promotion, lifestyle change, nursing education, nutrition, plant-based diet, plant-based nutrition

More than two-thirds of Americans are overweight or obese, leading to the development of chronic diseases such as coronary heart disease, cancer, and diabetes.¹ Heart disease is a leading cause of death in the United States, killing one in four Americans, and more than 73 million people have elevated cholesterol levels.² Nutrition is a key element in maintaining wellness and managing chronic illnesses, but many patients and health care providers don't recognize the value of altering the typical American diet (see *What Are Americans Eating?*³⁻⁵). Yet extensive research demonstrates that following a plant-based diet can help to prevent and manage overweight and obesity, heart disease, diabetes, and cancer, in addition to improving overall well-being (see *The Benefits of a Plant-Based Diet*⁶⁻²²).

Nurses at three faculty-led community health clinics associated with George Mason University in Fairfax County, Virginia, decided to explore the science behind plant-based nutrition and put this into practice in their own lives after a colleague (one of us, JE), who is a consultant and expert on plant-based nutrition, was hired by the university to provide a presentation on plant-based nutrition to the interprofessional clinic team. The nurses' goal in undertaking this project, in which they followed a plant-based diet for 21 days, was to improve their expertise and understanding in regard to nutrition, prepare them to be effective advocates of positive lifestyle changes for patients, and improve their personal awareness of the impact of

healthy food choices. Although this was not a formal research project, participants reported on their personal health outcomes. These results demonstrate that a strong educational nutrition program can be beneficial to nurses both personally and professionally.

For the purposes of this project, the term *plant-based diet* is used to describe a diet that focuses on four food groups—fruits, vegetables, whole grains, and legumes—as well as seeds and nuts. Meat, seafood, dairy products, and eggs are excluded. Highly refined foods, such as flour, sugar, and oil are avoided. A variety of diets may be referred to as plant-based in the literature—including a vegan diet, in which meat and animal products are omitted, and a vegetarian diet, which may include dairy products and eggs. These diets may also include sugar, flour, oil, and processed foods.

THE BENEFITS OF PLANT-BASED NUTRITION

Plant-based diets have been found to offer protection against overall cancer risk.^{18,23,24} A systematic review and meta-analysis of 12 randomized controlled trials found that people following a vegan diet lost more weight compared with those following a vegetarian or nonvegetarian diet.¹ A review of 27 randomized controlled and observational trials found that people following plant-based diets had significantly reduced blood lipid concentrations.²⁵ In addition, plant-based diets have been associated with decreased blood pressure.^{9,14}

According to a study of more than half a million people conducted by the National Institutes of Health and AARP, red and processed meat intake was associated with an increase in overall, cardiovascular, and cancer mortality rates.²⁶ A meta-analysis of 16 prospective cohort studies found that increased daily consumption of fruits and vegetables was associated with a reduced risk of all-cause mortality, specifically cardiovascular mortality.¹²

Plant-based diets can also be used to help prevent and manage type 2 diabetes.^{15,27} Studies have found a decrease in glycated hemoglobin levels among people with diabetes who adopted a plant-based diet.^{6,15} This type of diet was shown to improve indicators of depression, anxiety, and work productivity in one multicenter, randomized controlled trial.²¹ Beezhold and colleagues found that a plant-based diet may lead to better mental health.²²

A PLANT-BASED NUTRITION EDUCATIONAL PROGRAM

Considering this body of research, nursing faculty, graduate nursing students, and health care providers at nurse faculty–led community clinics decided they wanted an opportunity to increase their level of expertise regarding plant-based nutrition. They also wanted to experience firsthand the challenges and benefits of following this nutritional approach. The program began with an educational component, in which evidence was presented that demonstrated the benefits of plant-based nutrition. A 21-day trial



Photo © Shutterstock

period, during which participants followed a plant-based diet, came next. Each participant was offered the opportunity to join in any or all of the educational activities and could stop participating in the program at any time.

At the start and end of the program, participants reported their weight, had their cholesterol levels measured, and completed questionnaires. Cholesterol and weight are simple measures that are convenient to monitor and can be affected by dietary changes over a short period of time.⁹ In addition, cholesterol can be

What Are Americans Eating?

A diet heavy in sugar and saturated fat leaves little room for vegetables and fruit.

An analysis of data from What We Eat in America, the dietary component of the 2003–2006 National Health and Nutrition Examination Survey, revealed the top 10 foods consumed by Americans³:

1. cake, cookies, quick bread, pastries, and pie
2. yeast breads and rolls
3. soft drinks
4. beef
5. crackers, popcorn, pretzels, and chips
6. cheese
7. milk
8. candy, sugars, and sugary foods
9. poultry
10. alcoholic beverages

Together, these foods make up 50.8% of daily consumed calories.

A 2010 report from the Produce for Better Health Foundation showed that Americans consumed only 1.8 cups of fruits and vegetables (0.7 cups of fruit and 1.1 cups of vegetables) daily.⁴ That same year, the Dietary Guidelines for Americans recommended daily consumption of two cups of fruit and 2.5 cups of vegetables for those eating a 2,000-calorie diet.⁵



checked using point-of-care testing at the beginning and end of the program. To avoid embarrassment and prevent barriers to participation, we chose to have participants self-report their weight.

Educational component. The project was initiated at the beginning of the fall semester. JE gave the initial 90-minute presentation, entitled “Will Your Next Prescription Be to the Pharmacy or the Farmers Market?” It focused on nutritional research evidence regarding the effect of a plant-based diet on chronic disease, including diabetes, heart disease, obesity, and

some types of cancer. Participants were encouraged to identify why they might consider changing their nutritional habits. Reasons they cited for doing so included their health, the environment, the ethical treatment of animals, and their finances.

The group discussed the four basic food groups—fruits, grains, vegetables, and legumes—they’d be focused on during the 21-day trial period. Participants were encouraged to watch *Forks Over Knives*, a documentary feature film available on Netflix or Amazon that asserts that “modern diseases can be prevented,

The Benefits of a Plant-Based Diet

A summary of effects on health and well-being.

Overweight and Obesity

- A plant-based diet promotes weight loss.^{6,7}
- Overweight and obese adults who followed a plant-based diet lost more weight compared with those who followed a vegetarian diet or a nonvegetarian diet (including dairy, eggs, fish, and meat) at two and six months.⁸
- Following a plant-based diet for seven days led to a median weight loss of 1.4 kg.⁹

Heart Disease

- Radiographically documented heart disease regression occurred over one year in 82% of study participants as a result of intensive lifestyle changes, including a low-fat, plant-based diet.¹⁰
- Radiographically documented heart disease reversal occurred in 22% of 177 study participants who followed a plant-based diet; in 93% of those who reported angina at baseline, angina symptoms resolved or improved.¹¹
- A meta-analysis of 16 prospective cohort studies found that increased daily consumption of fruits and vegetables was associated with reduced cardiovascular mortality.¹²
- Following a plant-based diet for seven days led to improved lipid panels.⁹
- Significant mean reductions in total and low-density lipoprotein (LDL) cholesterol levels were reported among study participants who followed a low-fat, plant-based diet for 30 days.¹³
- A randomized controlled trial to determine the effect of an 18-week, plant-based nutrition intervention at the workplace found a significant improvement in mean total and LDL cholesterol levels.⁶
- A systematic review and meta-analysis of seven clinical trials and 32 observational studies found that consumption of diets that excluded meat was associated with a reduction in blood pressure when compared with omnivorous diets.¹⁴

Diabetes

- Following a plant-based diet was associated with a reduction in glycated hemoglobin levels among people with diabetes.^{6,15,16}
- Consuming meat on a weekly basis for 17 years was associated with a 74% increase in the risk of developing diabetes compared with long-term adherence to a nonmeat diet.¹⁷

Cancer

- A prospective cohort study of 69,120 adults found that plant-based diets confer a lower risk of overall cancer and female-specific cancers.¹⁸
- A review of more than 800 studies by 22 international scientists found that consumption of both red and processed meat is associated with cancer.¹⁹
- Lung, breast, and ovarian cancer have been linked to the intake of dairy foods.²⁰

Well-Being

- A randomized controlled trial on the effect of an 18-week, plant-based nutrition intervention at the workplace found significant improvements in depression, anxiety, fatigue, emotional well-being, and work productivity.²¹
- People following a plant-based diet reported less anxiety and stress compared with those who followed an omnivorous diet.²²

halted, and often reversed by leaving animal-based and highly refined foods off the plate . . . and adopting a whole-food, plant-based diet instead.”²⁸

At the conclusion of the presentation, participants discussed how they could share the information they’d learned with patients and colleagues. They also talked about how to integrate it into their own lives in order to improve their health and be better role models for their family and the community.

Trial period. The group followed the 21-Day Vegan Kickstart program (see www.pcrm.org/kickstartHome), a diet plan developed by the Physicians Committee for Responsible Medicine (PCRM) that does not include any animal foods or sugar, flour, or oil. (The PCRM is a research and advocacy organization that promotes the use of a plant-based diet to prevent and manage chronic disease and seeks alternatives to the use of animals in medical education and research.) This online program was selected because it is free, available monthly (the program runs from the 1st to the 21st of each month), and of relatively short duration. In addition, participants had access to cooking demonstrations, grocery lists, and menus for each day of the program. They also received daily e-mails that offered additional information and links to online support and education.

Participants could replace the recipes provided by the Kickstart program with other vegan recipes. In addition, they could also use the McDougall Program, a 10-day, free, plant-based program that also offers many recipes and extensive educational support, for guidance (see www.drmcDougall.com/health/education/free-mcdougall-program). There were no limits on portion sizes or calories.

Webinars. Three weekly Webinars held throughout the program provided participants with additional information and support, answers to questions, and details about participants’ final outcomes. The Webinars were led by JE, who was available by phone or e-mail throughout the program.

The first Webinar addressed challenges the participants were experiencing, including making food choices; eating at restaurants; and helping family members, some of whom were unsupportive, to adjust to this dietary change. Participants shared pictures of the foods they’d prepared to give others ideas about potential menu options.

The second Webinar focused on cooking for families and groups. Participants discussed ways to reduce the fat in their diets, as consuming increased amounts of fat slows weight loss. They also talked about strategies for continuing to follow a plant-based diet after the program ended. Web sites that offered information, inspiration, and support were identified (see *Plant-Based Nutrition Resources*).

Plant-Based Nutrition Resources

BOOKS

- Barnard ND. *21-Day Weight Loss Kickstart* (Hachette Book Group, 2011)
Barnard ND. *Dr. Neal Barnard’s Program for Reversing Diabetes* (Rodale Books, 2007)
Campbell TC, Campbell TM, II. *The China Study* (BenBella Books, 2005)
Esselstyne CB, Jr. *Prevent and Reverse Heart Disease* (Penguin Group, 2007)
McDougall J, McDougall M. *The Starch Solution* (Rodale Books, 2012)

WEB SITES

Nutritionfacts.org

<http://nutritionfacts.org>

Free videos offer updates about the latest nutrition research.

Physicians Committee for Responsible Medicine

www.pcrm.org

Free 21-Day Vegan Kickstart program, newsletters, and information about current research.

At the conclusion of the program, a final Webinar focused on the participants’ outcomes and the challenges they’d experienced.

Outcomes measurements. Each participant’s baseline cholesterol levels were determined at her or his convenience, either on the day of the educational presentation or at one of the clinics before the program began. Cholesterol testing was again conducted at the clinics during the week after the conclusion of the program. Participants weighed themselves at home at the start and end of the program.

All participants were encouraged to complete an online pre- and postprogram questionnaire. The questions focused on nutritional behaviors, such as daily consumption of vegetables and fruit and weekly consumption of meat, seafood, and dairy products. It also included questions regarding the participants’ sense of well-being, such as satisfaction with energy level, sleep, and overall health.

PARTICIPANTS’ RESULTS

A total of 19 nurses completed the program. Nearly three-quarters (74%) saw a decrease in total cholesterol during the course of the three-week trial (mean total cholesterol decreased from a preprogram level of 203 mg/dL to a postprogram level of 185 mg/dL). Six participants were able to lower their total cholesterol levels by 40 to 65 mg/dL. These results were similar to findings in the literature.^{9, 15, 25}



Based on the questionnaires, we learned that 53% of participants lost weight, accomplishing this without counting calories, monitoring food quantities, or rigidly following the diet. Individual weight loss over the three weeks ranged from 1.5 lb to 9 lb, averaging 4.4 lb. Participants reported an increase in vegetable and fruit consumption and a decrease in meat, seafood, and dairy intake (see Table 1). In addition, participants reported a dramatic improvement in satisfaction with their energy levels—11% were highly satisfied before the diet, whereas 41% felt this way afterward. Only 6% of participants were highly satisfied with their overall health before starting the program, but 44% felt this way after the program. The daily amount of meat, seafood, and dairy consumed by participants dropped during the trial, with only one and three of the 19 participants, respectively, reporting that they continued to eat meat and dairy daily. These results show that participants experienced positive results even when not following the dietary recommendations all the time.

had eaten fast food before the program—felt they did not have enough time for food preparation. In some cases, family members were not supportive and wanted the type of food they’d traditionally eaten. Cooking different meals for different family members was a challenge for some participants. In their responses to the questionnaire, a couple of participants noted that the program made them aware of how much chicken, beef, seafood, and cheese they ate on a daily basis—and they found that omitting these foods was a challenge. Sustaining the program for 21 days was difficult for those participants who continued to believe it was nutritionally necessary to consume animal foods on a daily basis.

What was helpful. Participants said many aspects of the experience were very worthwhile. They found the research in the initial 90-minute presentation, which focused on the correlation between food and disease, to be extremely valuable. In addition, participants reported that the 24/7 support available on the PCRM Web site, particularly its e-mail list,

Participants reported a dramatic improvement in satisfaction with their energy levels—11% were highly satisfied before the diet, whereas 41% felt this way afterward.

What was challenging. A program focused on changing nutritional patterns can be challenging, and this one was no exception. Participants were concerned, as are many people unfamiliar with plant-based diets, about obtaining sufficient amounts of protein, calcium, and iron. During the Webinars, JE responded to questions and offered additional educational materials and resources to those concerned about nutrients. In addition, several participants—especially those who

in addition to JE’s daily assistance, was helpful. Participants noted that the most critical outcomes of the program were the reductions in cholesterol levels and weight as a result of the change in their eating patterns. In addition, they found it very helpful that JE, an advanced practice nurse knowledgeable about plant-based nutrition, organized the program and provided guidance, expertise, and resources, so that educational information was translated into practice.

The experiential learning gained from participating in this program was meaningful, according to many participants. In a response on the final questionnaire, one participant noted, “This diet definitely helped me change the way I eat. Though I have begun to eat a little fish and poultry, I will continue to follow the plant-based diet for the most part.” Another said, “I am much more aware of how and where all my consumption of animal products occurs and now will limit that.”

IMPLICATIONS FOR PRACTICE

This plant-based nutrition educational program can be followed at most work sites, including in university

Table 1. Nurses’ Food Consumption Before and After the Plant-Based Nutrition Program

Foods	Percentage of Nurses	
	Before Program	After Program
Meat, 7 days a week	37	6
Dairy, 7 days a week	58	17
Vegetables, 3–5 daily servings	58	67
Fruit, 2–4 daily servings	53	83

and clinic settings. This type of program, with its experiential component, has the potential to influence a larger audience as participants apply the knowledge they've gained to their personal eating habits, patient care, and classroom discussions. The nurses who participated in the program now see a plant-based diet as a viable option for the prevention and treatment of chronic disease. They know they are allowing an important discussion to begin just by asking patients if they are aware of the value of plant-based nutrition. Tracking patients' risk factors and praising any signs of progress help to motivate and encourage patients to continue with this approach.

We are seeing a paradigm shift in health care, in which the focus is on the prevention of disease and not only on treatment with medication or surgery. Healthy eating is an essential component of prevention and wellness. The U.S. Department of Health and Human Services and Department of Agriculture update the nation's dietary guidelines every five years, and these guidelines help government officials set policy (for the latest guidelines, see <https://health.gov/dietaryguidelines/2015>). As the body of research on plant-based nutrition grows, nurses can advocate for including a plant-based prescription in the next set of dietary guidelines. ▼

Joanne Evans is the executive director of Healthy Nurses . . . Healthy Communities, LLC, in Rockville, MD. Alexandra Magee is an NP in the Department of Nursing at George Mason University in Oakton, VA, and was a graduate student at the time of this project. Kathy Dickman is retired and was an assistant research professor in the Department of Nursing at George Mason University in Oakton, VA, at the time of this project. Rebecca Sutter and Caroline Sutter are codirectors of the MAPS Clinic and assistant professors in the Department of Nursing at George Mason University, Fairfax, VA. Evans is a nursing consultant who specializes in plant-based nutrition and received payment from George Mason University for her work on this project. She is also a member of the scientific advisory board of Good Medicine, a publication of the Physicians Committee for Responsible Medicine. Contact author: Joanne Evans, joanneevans@verizon.net. The authors have disclosed no potential conflicts of interest, financial or otherwise.

REFERENCES

- Huang RY, et al. Vegetarian diets and weight reduction: a meta-analysis of randomized controlled trials. *J Gen Intern Med* 2016;31(1):109-16.
- Centers for Disease Control and Prevention. *Heart disease facts* 2015. <http://www.cdc.gov/heartdisease/facts.htm>.
- Huth PJ, et al. Major food sources of calories, added sugars, and saturated fat and their contribution to essential nutrient intakes in the U.S. diet: data from the National Health and Nutrition Examination Survey (2003-2006). *Nutr J* 2013; 12:116.
- Produce for Better Health Foundation. *State of the plate: 2010 study on America's consumption of fruits and vegetables*. Hockessin, DE 2010. http://pbhfoundation.org/pdfs/about/res/pbh_res/stateplate.pdf.
- U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary guidelines for Americans*, 2010. Washington, D.C.; 2010 Dec. <https://health.gov/dietaryguidelines/dga2010/dietaryguidelines2010.pdf>.
- Mishra S, et al. A multicenter randomized controlled trial of a plant-based nutrition program to reduce body weight and cardiovascular risk in the corporate setting: the GEICO study. *Eur J Clin Nutr* 2013;67(7):718-24.
- Sabaté J, Wien M. Vegetarian diets and childhood obesity prevention. *Am J Clin Nutr* 2010;91(5):1525S-1529S.
- Turner-McGrievy GM, et al. Comparative effectiveness of plant-based diets for weight loss: a randomized controlled trial of five different diets. *Nutrition* 2015;31(2):350-8.
- McDougall J, et al. Effects of 7 days on an ad libitum low-fat vegan diet: the McDougall Program cohort. *Nutr J* 2014;13:99.
- Ornish D, et al. Can lifestyle changes reverse coronary heart disease? The Lifestyle Heart Trial. *Lancet* 1990;336(8708): 129-33.
- Esselstyn CB, Jr, et al. A way to reverse CAD? *J Fam Pract* 2014;63(7):356-64.
- Wang X, et al. Fruit and vegetable consumption and mortality from all causes, cardiovascular disease, and cancer: systematic review and dose-response meta-analysis of prospective cohort studies. *BMJ* 2014;349:g4490.
- Kent L, et al. The effect of a low-fat, plant-based lifestyle intervention (CHIP) on serum HDL levels and the implications for metabolic syndrome status—a cohort study. *Nutr Metab (Lond)* 2013;10(1):58.
- Yokoyama Y, et al. Vegetarian diets and blood pressure: a meta-analysis. *JAMA Intern Med* 2014;174(4):577-87.
- Barnard ND, 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(8):1777-83.
- Yokoyama Y, et al. Vegetarian diets and glycemic control in diabetes: a systematic review and meta-analysis. *Cardiovasc Diagn Ther* 2014;4(5):373-82.
- Vang A, et al. Meats, processed meats, obesity, weight gain and occurrence of diabetes among adults: findings from Adventist Health Studies. *Ann Nutr Metab* 2008;52(2):96-104.
- Tantamango-Bartley Y, et al. Vegetarian diets and the incidence of cancer in a low-risk population. *Cancer Epidemiol Biomarkers Prev* 2013;22(2):286-94.
- Bouvard V, et al. Carcinogenicity of consumption of red and processed meat. *Lancet Oncol* 2015;16(16):1599-600.
- Ji J, et al. Lactose intolerance and risk of lung, breast and ovarian cancers: aetiological clues from a population-based study in Sweden. *Br J Cancer* 2015;112(1):149-52.
- Agarwal U, et al. A multicenter randomized controlled trial of a nutrition intervention program in a multiethnic adult population in the corporate setting reduces depression and anxiety and improves quality of life: the GEICO study. *Am J Health Promot* 2015;29(4):245-54.
- Beezhold B, et al. Vegans report less stress and anxiety than omnivores. *Nutr Neurosci* 2015;18(7):289-96.
- Campbell TC, et al. Diet, lifestyle, and the etiology of coronary artery disease: the Cornell China study. *Am J Cardiol* 1998;82(10B):18T-21T.
- Key TJ, et al. Cancer incidence in vegetarians: results from the European Prospective Investigation into Cancer and Nutrition (EPIC-Oxford). *Am J Clin Nutr* 2009;89(5):1620S-1626S.
- Ferdowsian HR, Barnard ND. Effects of plant-based diets on plasma lipids. *Am J Cardiol* 2009;104(7):947-56.
- Sinha R, et al. Meat intake and mortality: a prospective study of over half a million people. *Arch Intern Med* 2009;169(6): 562-71.
- Tonstad S, et al. Type of vegetarian diet, body weight, and prevalence of type 2 diabetes. *Diabetes Care* 2009;32(5):791-6.
- Forks Over Knives. *About forks over knives*. n.d. <https://www.forksoverknives.com/about-us>.