Effects of Tele-Health Coaching on Dietary Compliance in the Nutritarian Women's Health Study

Tara Kemp, BA, Ashley Frechette & Gabby Kennedy
Mentors: Jay Sutliffe, PhD, RD; Julia Gardner, BS, CHES; Gigi Lopez, PhD
PRANDIAL Lab: Department of Health Sciences, Northern Arizona University

Abstract

Purpose: This study aimed to test the efficacy of tele-health coaching to increase dietary compliance and reduce weight, body mass index (BMI), and waist circumference within the Nutritarian Women's Health Study (NWHS).

Background: Prior research supports that lifestyle factors account for the prevention of numerous chronic diseases. Health coaching is emerging as a valuable tool for facilitating behavior change to support lifestyle habits that promote greater long-term health outcomes.

Methods: The eligibility criteria were as follows: 1) adults ≥18 years of age; 2) enrolled in the NWHS; 3) had a starting BMI of ≥25 and <30 kg/m^2; 4) have telephone access. Participants were randomized to either the standard NWHS support or to standard NWHS study support plus 6-week telehealth coaching. Participants completed the Nutritarian Health Indicator (NHI), a Nutritarian specific food frequency questionnaire, and the National Cancer Institute Automated Self-Administered Recall System (ASA24) for a 24-hour diet recall.

Conclusions: The NWHS Health Coaching arm showed that 6-week coaching was more effective for improving exercise than eating behaviors. Characteristics of study design may have led to less significant results, so suggestions for future research are addressed.

Introduction

It is well documented that lifestyle factors account for the prevention or development of a majority of chronic diseases (Ford et al, 2009; Sagner et al, 2014; Ornish et al, 2005). Simple behaviors such as not smoking, moderate regular exercise, and eating more fiber-rich plant foods can have substantial effects on one's health.

The Nutritarian diet is composed of nutrient-dense, plant-rich (NDPR) foods such as greens, beans, onions, mushrooms, berries, and seeds. These nutrient-dense foods have shown to be beneficial with weight reduction (Sutliffe et al, 2016; Sarter et al, 2008) and the prevention and even reversal of many common chronic diseases such as diabetes and cancer (Ford et al, 2009; Sagner et al, 2014; Ornish et al, 2005).

The Nutritarian Women's Health Study (NWHS) is a longitudinal hybrid effectiveness-implementation study that seeks to track women to determine the role of a NDPR diet on the incidence and progression of chronic diseases over the span of 10 years. This arm of the study aimed to investigate the effectiveness of health coaching, specifically around nutrition, to improve diet quality and dietary compliance.

To initiate healthy behavior changes, health coaching has been used to increase the chances of reaching a goal such as weight reduction, disease maintenance, and overall health. Health coaching is a growth-promotion relationship that elicits motivation, increases the capability to change, and facilitates a change process through visioning, goal setting, and accountability, which at its best leads to sustainable change for the good (Moore, et. al, 2016). Studies of health coaching interventions have shown positive results for influencing behavior change in physical activity, nutrition, and weight loss, as well as improved health outcomes for chronic diseases such as type 2 diabetes and cardiovascular disease (Hill et al., 2015; Olsen et al., 2010; Vale et al., 2003; Wolever et al., 2010).

Methods & Materials

Inclusionary Criteria:

- ✓ Female
- ✓ 18 years and older
- ✓ United States resident
- ✓ Online access
- ✓ BMI between 25.0-29.9 kg/m^2

Participants: The NWHS participants who met inclusionary criteria of being between 25.0-29.9 BMI kg/m^2 (overweight), volunteered to be in the study, and were not pregnant, were randomly assigned to either a control or treatment group. There was a total of 29 participants in the control group and 24 in the treatment group.

Procedures: Study participants in the treatment group received 6 consecutive weeks of health coaching, conducted over the telephone. Participants were assigned to one of four health coaches and completed all 6 coaching sessions with the same coach.

Data Collection: Dietary intake data for 24-hour diet recalls were collected and analyzed using the Automated Self-Administered 24-hour (ASA24) Dietary Assessment Tool, version 2018, a Health Indicator questionnaire that is specific to the Nutritarian dietary guidelines of the NWHS. Study data are collected and managed using REDCap electronic data capture tools hosted at Northern Arizona University.

Table 1. Control (1) vs. Intervention (2) Group Pre-Post Changes

Measure	Group	Pre-Post Change	Statistical Significance
Vitamin C (mg)	1	38.40	0.6510
	2	75.54	
Beta Carotene (mcg)	1	-3826	0.8160
	2	-1819	
Dark Green Veggies (cup eq)	1	0.8605	0.7620
	2	0.6018	
Red and Orange Veggies (cup eq)	1	-0.1534	0.9970
	2	-0.1557	
Legumes (cup eq)	1	0.2980	0.0780
	2	-0.2510	
Whole Grains (oz eq)	1	-0.9610	0.6180
	2	-0.1185	
Nuts and Seeds (oz eq)	1	0.0115	0.7690
	2	0.3734	
Fiber (g)	1	0.4325	0.7220
	2	-2.760	
Saturated Fat (g)	1	-3.958	0.6740
	2	-6.643	
Cholesterol (mg)	1	-12.81	0.2020
	2	-69.65	
Weight (lb)	1	1.024	0.3230
	2	-0.2059	
BMI (kg/m^2)	1	0.0843	0.5890
	2	-0.0212	
Waist Circumference (in)	1	-0.3917	0.8820
	2	-0.5441	
Exercise (7-point scale)	1	-0.8571	0.0380
	2	0.2941	

Results

The intervention group had very low compliance in completing follow-up surveys (17 of 24 participants completed the NHI, and 9 of 24 participants completed the ASA24).

Based on the given responses, there were not significant changes in overall dietary quality or in weight, body mass index (BMI) or waist circumference in the intervention group after the 6-week health coaching intervention. There was an increase in exercise post-intervention, but it was not statistically significant.

The relationship between legumes and weight (.059) and the relationship between dark green vegetables and waist circumference (.079) were trending toward significance. The relationship between intake of beta carotene and waist circumference was statistically significant (.009).

As seen in table 1, in comparison to the control group, at the post-intervention assessment, the change in legume intake was trending toward significance (.078), and the changes in exercise and saturated fat intake were both significant (.05 and .03, respectively).

Discussion & Conclusions

The lack of significant changes is probably a consequence of weaknesses in the experimental design. Dietary compliance was high from the start with the intervention group, meaning there was less room for improvement. Furthermore, despite randomization, the intervention group had greater dietary quality than the control group at baseline.

Because dietary compliance was high pre-intervention, a 6 week intervention period may not have been long enough to elicit measurable changes in weight, BMI, or waist circumference. In addition, the primary follow-up surveys were collected during the holiday season, which may have contributed to the low rate of survey completion. Due to this low follow-up compliance, the results that were documented may not be representative of the entire group.

Despite these limitations, the findings that the study did show are valuable and merit further exploration. The significant changes seen in exercise but not dietary quality may reflect that health coaching is more effective for promoting changes in physical activity than eating behaviors. Another potential cause for this outcome is that because participants have received support for dietary change in the past but not exercise, the health coaching provided a novel opportunity to focus on this and therefore boosted that behavior. Future studies may wish to explore these ideas further.

The correlations between greater dark green vegetable and beta carotene intake with weight/waist reduction are in accordance with prior literature on diet and weight management, but the correlation with decreased legumes was in opposition (Rolls, Ello-Martin, & Tohill, 2004; Williams, Grafenauer, & O'Shea, 2008).

These results suggest the potential of health coaching to increase exercise habits in particular as well as dietary habits, but further research is needed. In future studies, we would recommend selecting the participants based on a particular level of dietary compliance rather than a particular range of BMI in order to focus more specifically on this factor. We also believe that a longer intervention period would enhance behavior change and allow for greater changes in health markers to be measured. Finally, incentivizing participants and strategically planning the timing for survey collection would help to increase response rate.

Contact
Nutritarian Women's Health Study
Northern Arizona University
PO Box 15095
Flagstaff, AZ, 86011
Email: nwhs@nau.edu
Website: nau.edu/nwhs
Phone: 928-523-6954

This study is funded by the Nutritional Research Foundation

References

1. Ford ES, Bergmann MM, Kröger J, Schienkiewitz A, Weikert C, Boeing H. Healthy living is the best revenge: findings from the European Prospective Investigation Into Cancer and Nutrition-Potsdam study. *Archives of internal medicine*. 2009;169(15):1355-1362.
2. Hill B, Richardson B, Skouteris H. Do We Know How to Design Effective Health Coaching Interventions: A Systematic Review of the State of the Literature. *American Journal of Health Promotion*. 2015;29(5):e158-e168.
3. Moore, M., Jackson, E., & Tschannen-Moran, B. (2016). *Coaching psychology manual*. Philadelphia: Wolters Kluwer.
4. Olsen JM, Nesbitt BJ. Health Coaching to Improve Healthy Lifestyle Behaviors: An Integrative Review. *American Journal of Health Promotion*. 2010;25(1):e1-e12.
5. Ornish D, Weidner G, Fair WR, et al. INTENSIVE LIFESTYLE CHANGES MAY AFFECT THE PROGRESSION OF PROSTATE CANCER. *The Journal of Urology*. 2005;174(3):1065-1070.
6. Sagner M, Katz D, Egger G, et al. Lifestyle medicine potential for reversing a world of chronic disease epidemics: from cell to community. *International Journal of Clinical Practice*. 2014;68(11):1289-1292.
7. Sarter, B., Campbell, T. C., & Fuhrman, J. H. (2008). Effect of a high nutrient density diet on long-term weight loss: A retrospective chart review. *Alternative Therapies, 14(3),* 48-53. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/18517106
8. Sutliffe, J. T., Fuhrman, J. H., Carnot, M. J., Beetham, R., & Peddy, M. S. (2016). Nutrient-dense, plant-rich dietary intervention effective at reducing cardiovascular disease risk factors for worksites: a pilot study. *Alternative Therapies in Health and Medicine, 22*(5), 32-36. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/27622958
9. Vale MJ, Jelinek MV, Best JD, et al. Coaching patients on achieving cardiovascular health (coach): A multicenter randomized trial in patients with coronary heart disease. *Archives of Internal Medicine*. 2003;163(22):2775-2783.
10. Wolever RQ, Dreusicke M, Fikkan J, et al. Integrative Health Coaching for Patients With Type 2 Diabetes. *The Diabetes Educator*. 2010;36(4):629-639.