The impact of a 12-week nutrition intervention on health and wellness in the workplace

Jay Sutliffe, PhD, RD[1]; Michelle Gorman, RD[2]; Julia Scheid, BS[1]; Wendy Wetzel, MSN[1]; Tricia Fortin, MPH[1]; Mary Jo Carnot, PhD[3] ; Alison Adams, PhD[1]

[1]Northern Arizona University, [2]Northern Arizona Healthcare, [3]Chadron State College

Abstract

Purpose: Community Chronic Disease Prevention (CCDP) intervention focused on adopting a micronutrient-dense, plant-rich (mNDPR) diet, to assess the effects on overall cardiometabolic risk factors, healthcare expenditure, and wellness for the participants.
Methods: Pre- and post-intervention biometric screening tests and anthropometric measurements were completed to measure total cardiometabolic risk factors and gastroesophageal reflux disease (GERD). Wellness factors were measured by the following assessment tools: Quality of Life Index (QLI), Patient Health Questionnaire-9 (PHQ-9), Pittsburgh Sleep Quality Index (PSQI), and Work Productivity and Activity Impairment (WPAI).
Results: Post-intervention assessment of participants resulted in significant improvements in several cardiometabolic risk factor measurements and GERD scores. Average improvements for wellness factors were shown for sleep quality, quality of life, and work-productivity, with the most significant results for a reduction in depressive symptoms.
Conclusion: This intervention resulted in convincing improvements in several measures of cardiometabolic risk reduction and wellness measures improving their overall well-being by adhering to a mNDPR diet.

Introduction

In the USA, ~2/3 of adults are overweight, and of these 37.9% are obese[1]. This presents a grave threat to the health and economy of the nation, as obesity is linked to diabetes and other major chronic diseases; in 2012 the economic burden to the US of diabetes alone was $245 billion[2]. Lifestyle intervention programs such as Diabetes Prevention Program (DPP) have been found to reduce the risk of developing diabetes by 58%[3]. In the dietary component of DPP, participants are encouraged to lose weight by reducing their caloric intake and lowering fat intake to less than 25% of total calories[3]. Intake of macronutrients has been the primary focus of dietary interventions such as DPP, but micronutrient intake is commonly overlooked, yet equally important. Foods low in micronutrients may stimulate over-eating and food cravings[4], which are common barriers to sustained weight loss and reduced risk of diabetes. Secondly, micronutrients are required as cofactors for a wide diversity of cellular processes, and plant foods that are rich in antioxidants, vitamins, minerals and phytochemicals are strongly associated with reducing diabetes and other cardiometabolic risk factors[5].

Since the average person devotes over 90,000 hours in a lifetime to their employment[6], the workplace can be a very effective environment to incorporate healthy interventions. Community Chronic Disease Prevention (CCDP) focused on adopting a micronutrient-dense, plant-rich (mNDPR) diet to reduce cardiometabolic risk factors, improve employee wellbeing, and reduce healthcare expenditures. The participants were recruited from the working adult population at Northern Arizona University (NAU) and Northern Arizona Healthcare.

Methods

Participants

- ✓ Seventy-seven employees/spouses of Northern Arizona University and Northern Arizona Healthcare
- ✓ 18 years old or older
- ✓ Waist circumference of >35” for females and >40” for males
- ✓ BMI of 28 or greater
- ✓ Average age of 48.11 years old

Procedures

This intervention utilized the health belief model. We focused on how cardiometabolic risk factors and wellness measures of participants were affected by 12 weeks of nutrition education, which included 6 hours of introductory education, and one-hour weekly meetings. We combined 20 plus hours of in-person lecture, take home materials, and guest speakers. The educational sessions informed participants how to implement a mNDPR diet.

Data Collection

- ✓ Wellness measures: Quality of Life Index, Patient Health Questionnaire-9, Pittsburgh Sleep Quality Index, Work Productivity and Activity Impairment
- ✓ Biometric screenings – Pre and Post

Results

Post-intervention assessment of participants resulted in significant improvements in several measurements. Average reductions as shown in Table 1 were as follows: weight, 12.27 pounds; waist, 2.64 inches; hip, 1.50 inches; blood pressure, 6.79 mm Hg (systolic) and 9.81 mm Hg (diastolic); total cholesterol, 18.10 mg/dl (8.61% reduction); LDL, 12.81 mg/dl (10.11% reduction); GERD scores, 2.63 points (70.8% reduction).

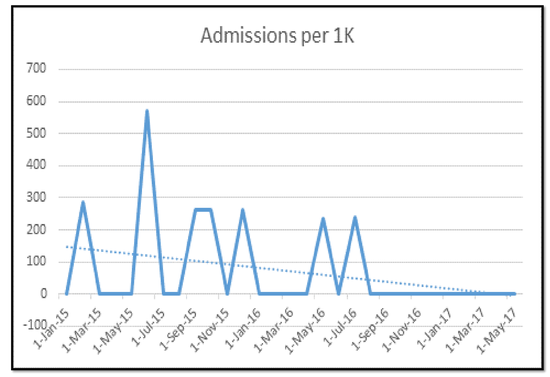
Metric	N	Median Time 1	Median Time 2	Significance (p level)
Weight	75	212.75	191.75	<.001
Waist	76	42.88	41.00	<.001
Hips	76	46.00	44.50	<.001
Total Cholesterol	77	213	187	<.001
LDL Reduction	74	126.5	107.00	<.001
Fructosamine	77	228.00	225.00	.011
Glucose	77	98.00	95.00	.001
hs-CRP	77	3.5	2.3	.008
Systolic	75	132	126	<.001
Diastolic	75	84.00	74.00	<.001
GERDQ	67	2.00	0.00	<.001
Quality of Life	68	21.14	24.38	<.001
Work Productivity	71	.20	.00	<.001
PHQ9	71	6.00	2.00	<.001

Table 1. Reduction in cardiometabolic risk factors and wellness measures

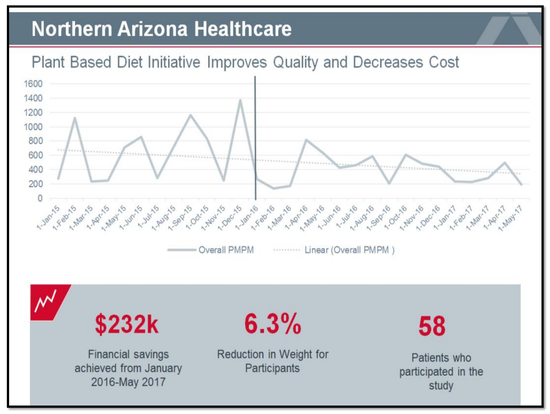
Results

Average improvements as shown in Table 1 for wellness factors are as follows: PSQI (5.4%); QLI (17.7%); WPAI (38.5%). The most significant results for wellness factors were drawn from the PHQ-9 as shown through a reduction in depressive symptoms by 58%, changing the average classification of the participants from mild depression to minimal depression.

Northern Arizona Healthcare employees showed significant improvements in healthcare utilization. As shown in Graph 2, there was a total decrease in healthcare utilization, both medical and pharmacy of $232K from January 2016- May 2017.



Graph 1. NAH study participant hospital admissions per 1,000



Graph 2. study participant hospital admissions and economic impact NAH

Discussion & Conclusion

This intervention resulted in convincing improvements in several measures of cardiometabolic risk reduction and wellness measures by adhering to a mNDPR diet. The most significant results were drawn from the Patient Health Questionnaire-9 as shown through a reduction in depressive symptoms by 58%, classifying the participants from mild depression to minimal depression. Additionally, healthcare expenditures for NAH participants declined, resulting in significant economic savings. This intervention has proven to be effective at reducing CVD risk factors as well as improving participants’ overall quality of life. Widespread workplace implementation of an mNDPR diet should be considered for increasing work productivity and the overall wellness of employees. The results from this pilot study warrant further investigation that includes a more diverse and larger number of participants to administer a more comprehensive study.

Contact

PRANDIAL Lab
PrandialLab@nau.edu
Northern Arizona University
1100 S. Beaver St. PO Box 15095 Flagstaff, AZ, 86011
P: 928-523-7596|F: 928-523 0148|W: Prandiallab.com

This project was supported through funding provided by Northern Arizona Healthcare’s lifepath and Blue Cross Blue Shield of Arizona

References

1. National Center for Health Statistics. (2017). Health, United States, 2016: With Chartbook on Long-term Trends in Health. Hyattsville, MD.
2. Centers for Disease Control and Prevention. (2017). National Diabetes Statistics Report, 2017. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services.
3. U.S. Department of Health and Human Services. (2008). Diabetes Prevention Program (DPP). Bethesda, MA: National Diabetes Information Clearinghouse.
4. Fuhrman, J., Sarter, B., Glaser, D., & Acocella, S. (2010). Changing perceptions of hunger on a high nutrient density diet. *Nutrition Journal, 9*(51). doi: 10.1186/1475-2891-9-51
5. Slavin, J. & Lloyd, B. (2012). Health benefits of fruits and vegetables. *Advanced Nutrition, 3*(4), 506-516. doi: 10.3945/an.112.002154
6. Pryce-Jones, J. (2010). Happiness at Work: Maximizing your psychological capital for success. Wiley.