A Dietary Intervention Comparison of Healthy Young Adults and Those with Metabolic Syndrome

Clark RL[1], Cesa M[1], Kinkade O[1], Waanders TR[1], Arbogast MD[1], Holásková I[1], Downs MT [1], Murray PJ [1], McFadden JW [1], Cuff CF [1], Olfert IM [1], Colby SE [2], Olfert MD [1]

[1]West Virginia University, Morgantown, WV; [2]University of Tennessee, Knoxville, TN

LIFESTYLE INTERVENTION
OLFERT RESEARCH LAB

Introduction

Chronic diseases have become a major health concern nationwide. The metabolic syndrome (MetS) is a cluster of risk factors which, when combined, increase an individual's risk for these chronic diseases. One strategy for decreasing these rates is to identify the unique role of nutrition and lifestyle behaviors in the development of disease so public health interventions can then target these risk factors.

Objective

To determine if young adults with Metabolic Syndrome (MetS) have different dietary habits than healthy young adults, and respond differently to a dietary intervention.

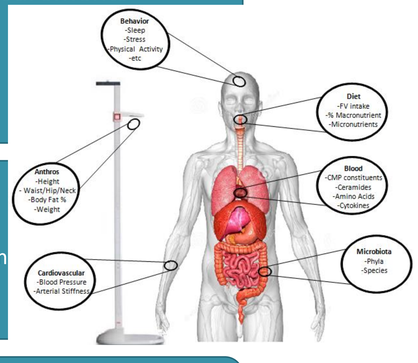
Methods

Cohort 1: "At-risk" subjects recruited in the Fall of 2014

Cohort 2: MetS subjects recruited in the Fall of 2016

Baseline and Post Measurements

- Stool samples
- Arterial stiffness
- Anthropometrics
- Venous blood samples



Diet Education

- Educate on MyPlate diet
- Group 90 minute education
- Nutrition 101
- Culinary kit

Weekly Counseling- 8 weeks

- 1-hour with RDN in training
- Return daily diet log, food pictures, food receipts
- Motivational interviewing

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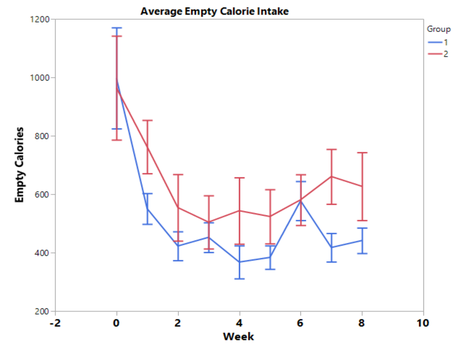
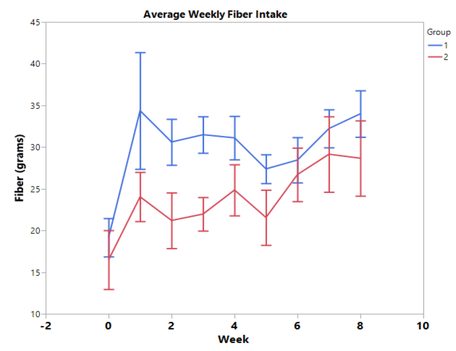
Results

Table 1: Impact of intervention on dietary variables based on cohort.

Dietary Factor	Cohort	Mean ± SD Pre-Intervention	Mean ± SD Post-Intervention	p-value Cohort Effect	p-value Intervention Effect	p-value Intervention x cohort
Kilocalories	1	2263.3 ± 1375.1	1935.7 ± 622.6	0.324	0.116	0.577
	2	2252 ± 1299	1935 ± 805			
Carbohydrate (%)	1	42.6 ± 13.4	53.8 ± 9.6	0.427	0.044*	0.084
	2	49.7 ± 16.0	53.3 ± 10.6			
Fat (%)	1	36.1 ± 10.0	29.4 ± 9.2	0.163	0.006*	0.637
	2	35.27 ± 12.2	28.2 ± 8.5			
Protein (%)	1	16.4 ± 6.3	19.3 ± 4.5	0.012*	0.04*	0.679
	2	15.2 ± 6.3	18.5 ± 5.5			
Fiber (grams)	1	19.2 ± 12.6	34.0 ± 15.2	0.003*	<.0001*	0.9207
	2	16.5 ± 13.6	28.7 ±17.5			
Insoluble fiber (grams)	1	1.4 ± 2.1	3.3 ± 2.5	0.801c	<0.0001*c	NA
	2	1.1 ± 1.9	5.8 ± 7.2			
Soluble fiber (grams)	1	0.3 ± 0.4	0.8 ± 0.6	0.020*c	0.0005*c	NA
	2	0.3 ± 0.66	0.7 ± 0.8			
Total Sugar (grams)	1	78.7 ± 34.0	105.4 ± 43.5	0.755	0.023*	0.95
	2	93.9 ± 71.8	98.3 ± 58.9			
Empty Calories	1	997.6 ± 948.1	441.6 ± 240.1	0.038*	<.0001*	0.702
	2	964.3 ± 689.4	627.1 ± 449.8			
Monounsaturated Fat (grams)	1	21.0 ± 23.0	16.8 ± 12.0	0.16	0.729	0.445
	2	26.1 ± 26.17	20.1 ± 13.6			
Polyunsaturated Fat (grams)	1	13.9 ± 15.0	10.1 ± 6.7	0.91	0.967	0.677
	2	13.5 ± 15.6	11.9 ± 10.1			
Saturated Fat (grams)	1	28.8 ± 21.6	20.5 ± 13.1	0.053	0.105	0.216
	2	29.4 ± 21.2	19.3 ±8.1			
Cholesterol (mg)	1	227.3 ± 215.6	247.4 ± 247.5	0.131	0.114	0.735
	2	266.6 ± 287.8	205 ± 147.2			
Fruit & Vegetables (cups)	1	2.5 ± 2.0	5.2 ± 2.4	0.0851	<.0001*	0.043*
	2	1.7 ± 1.5	4.6 ± 1.5			

*Diet Effect p<0.001





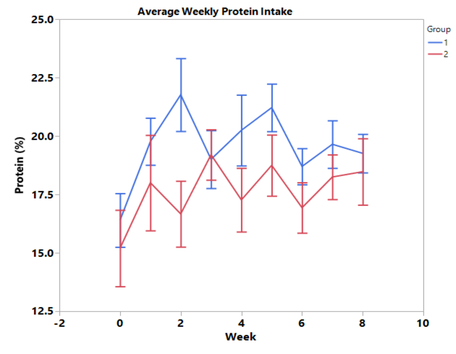
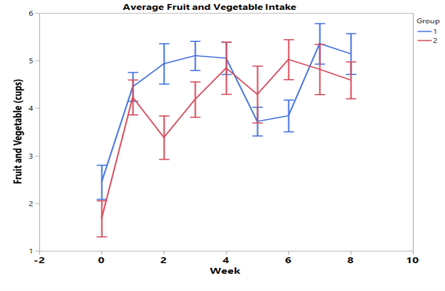


Figure 1: Dietary differences between the two cohorts yielded significant differences in %protein (p=0.012), %fiber (p=0.003), and empty calories (p=0.038).

Figure 2: Fruit and vegetable intake weekly group by diet interaction (p= 0.043), with cohort 1 maintaining a higher fruit and vegetable intake at both pre-intervention and post-intervention (2.5 ± 2.0 and 5.2 ± 2.4 cups/day respectively, whereas cohort 1 intake was 1.7 ± 1.5 and 4.6 ± 1.5 cups/day, respectively.



Conclusion and Implications

Both cohorts did improve in dietary intake by the end of the 8-week free-living dietary intervention. However, young adults with MetS had lower overall dietary quality in comparison to the healthy cohort before and after the intervention. This indicates that those with a lower diet quality beginning the intervention, like the MetS cohort, may require longer dietary interventions to yield the same dietary improvements that can result in better metabolic health and skills to improve their diet. Thus, identification of young adults with chronic disease risk factors allows for time to implement a nutrition intervention to promote behavior change and improve health.