Does knowledge and/or use of MyPlate correlate to better diet quality?

Taylor Towne, Virginia Gray PhD RD, Michael Hill MA MPH, Long Wang PhD MD RDN FAND

Department of Family & Consumer Sciences

College of Health & Human Services, California State University Long Beach

Introduction

Healthier eating patterns can potentially decrease the prevalence and risk for chronic diseases, help support a healthy body weight and help individuals meet nutrient needs. In comparison to the 2015-2020 Dietary Guidelines for Americans (DGA), current eating patterns of Americans, on average, do not meet the recommended DGA[1,2,3].

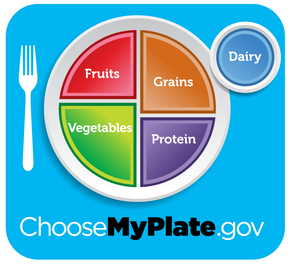

Figure 1. The MyPlate infographic

MyPlate is an infographic that is used to help educate the public and influence consumer food decisions by reinforcing the importance of a balanced, nutrient dense meal. Since its release in 2011, MyPlate familiarity has been found to range anywhere from 20% to 67% of the population[4,5,6].

MyPlate is a commonly used tool for basic nutrition education. Significant improvements in diet, nutrition knowledge, physical activity, and knowledge of MyPlate have been seen in a variety of studies[7,8,9].

The purpose of this study is to investigate demographic and diet quality factors in relationship to MyPlate awareness and use using the NHANES 2013-2014 data.

Methods

Once the proper datasets from the NHANES 2013-2014 dataset were downloaded and exclusion criteria were met, a new HEI variable was created and descriptive statistics were run using SPSS. Various statistical tests were then run to complete the analysis:

- **Chi Squared Tests:** to determine the relationship between various demographic factors: age, gender, race/ethnicity, education status, income and MyPlate awareness and use
- **Independent Samples T-Tests:** to explore bivariate relationships between HEI scores and MyPlate knowledge, if the participant has looked up MyPlate, and use of a MyPlate plan
- **Multiple Linear Regression Analysis:** to explore the ability to predict HEI score while controlling for demographic covariates of race/ethnicity, annual household income, and education level
- **Linear Probability Model:** to determine the association of total average HEI score with the likelihood of having heard of my plate, looked up MyPlate or tried a MyPlate Plan

Results

Descriptive Statistics:

20.24% (n = 646) Have Heard Of MyPlate

40.09% (n = 259) Have Looked Up MyPlate

35.14% (n = 227) Have Tried A MyPlate Plan

Total average HEI score was **52.45** / 100

Linear Probability:

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Heard Of MyPlate	0.002** (0.00)	0.002** * (0.00)				
Looked Up MyPlate			0.001 (0.00)	0.005 ** (0.00)		
Tried MyPlate Plan					.003** (0.00)	0.003 (0.00)
Demographic Controls	No	Yes	No	Yes	No	Yes
Races	No	Yes	No	Yes	No	Yes
Educations	No	Yes	No	Yes	No	Yes
Incomes	No	Yes	No	Yes	No	Yes
Constant	0.041* (0.02)	0.113** (0.04)	0.263 *** (0.06)	1.71 (0.11)	0.166** (0.06)	0.022 (0.11)
N	5,675	2,572	964	509	963	509
R^2	.008	.080	.002	.076	.010	.088

*p<.05, **p<.01, ***p<.001

Table 4. Linear Probability Models to predict MyPlate variables based on mean HEI scores.

Interpretation for Models 1 and 2:

Model 1: The likelihood of having heard of MyPlate increased by 0.2% for every one-point increase in total HEI score. As total average HEI increased by 10 points, individuals are 2% more likely to have heard of MyPlate.

Model 2: When controlling for demographic variables, again, the likelihood of having heard of MyPlate increased by 0.2% for every one-point increase in total average HEI.

Linear Regression:

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Heard Of MyPlate	3.20 *** (0.48)	2.37 *** (0.63)						
Looked Up MyPlate			1.22 (0.98)	3.08 ** (1.18)			0.91 (1.37)	4.02 * (1.65)
Tried MyPlate Plan					2.97 ** (0.96)	2.01 (1.22)	3.55 ** (1.32)	2.51 (1.90)
Looked up MyPlate &Tried MyPlate Plan							-1.60 (2.07)	-3.27 (2.63)
Demographic Controls	No	Yes	No	Yes	No	Yes	No	Yes
Race	No	Yes	No	Yes	No	Yes	No	Yes
Education	No	Yes	No	Yes	No	Yes	No	Yes
Income	No	Yes	No	Yes	No	Yes	No	Yes
Constant	52.77 *** (0.20)	47.54 *** (0.86)	55.56 *** (0.57)	48.92 *** (1.76)	54.90 *** (0.57)	48.82 *** (1.71)	54.70 *** (0.65)	48.64 *** (1.77)
N	5,675	2,572	964	509	963	509	963	509
R^2	.008	.157	.002	.234	.010	.227	.010	.237

*p<.05, **p<.01, ***p<.001

Table 5. Linear Regression Models to Predict Mean HEI score based on MyPlate and Demographic Variables

Interpretation for Models 1 and 2:

Model 1: Average total HEI score for those who had not heard of MyPlate was 52.77. Mean total HEI score was found to statistically significantly increase by 3.2 points once an individual has heard of MyPlate.

Model 2: When controlling for gender, race, educational status, and annual household income, the average total HEI score for those who had not heard of MyPlate was 47.54. Mean total HEI score then increased by 2.37 points for those who have heard of MyPlate.

Before introducing controls, only 0.8% of the variance in HEI score was explained by the Heard of MyPlate variable. Once controls were introduced, 15.7% of the variance was explained by the model variables, meaning demographic variables explain about 7% of the variance in HEI score.

Chi Squared Tests

Gender Significant relationship with those who have **heard of** and **tried** MyPlate

Education Significant relationship with those who have **heard of** and **looked up** MyPlate

Ethnicity Significant relationship with those who have **heard of** MyPlate

Independent Samples T-Tests:

Variable	n	Mean HEI Total Score (SE)	t	p
Heard of MyPlate	964	**55.97** (0.46)	6.38	< .001
Not Heard of MyPlate	4,711	**52.77** (0.20)		

Table 1. There is a significant difference in mean total HEI scores between those who have heard of MyPlate and those who have not heard of MyPlate by 3.2 points.

Variable	n	Mean HEI Total Score (SE)	t	p
Looked Up MyPlate	325	**56.77** (0.84)	1.24	.214
Not Looked Up MyPlate	639	**55.56** (0.55)		

Table 2. There is not a significant difference in mean total HEI scores between those who have have looked up MyPlate and those who have not looked up MyPlate on the Internet.

Variable	n	Mean HEI Total Score (SE)	t	p
Tried a MyPlate Plan	338	**57.88** (0.80)	3.09	.002
Not Tried a MyPlate Plan	625	**54.90** (0.56)		

Table 3. There is a significant difference in mean total HEI scores between those who have tried a MyPlate plan and those who have not tried a MyPlate plan by 2.98 points.

Discussion

- Awareness of MyPlate was found to be at the bottom (20%) of the range found in previous research (20-67%)
- The moderately high percent of those who reported looking up (40%) and trying (39%) after hearing about it suggests that participants who know about MyPlate may be interested in learning more about it and using it for diet planning which is consistent with previous research
- Diet quality findings are consistent with previous research in that:
  - Americans on average do not meet the recommended DGA
  - Americans tend to consume a diet low in fruits, vegetables and whole grains
  - Americans tend to consume a diet high in added sugars and refined grains
  - As education level increases, diet quality improves
  - Females consistently have higher HEI scores
  - As annual household income increases, diet quality improves
- Race/ethnicity plays a role in diet quality but results did not support previous research by finding that non-Hispanic Asians had the best diet quality when compared to non-Hispanic Whites

Statistically Significant ≠ Meaningfully Significant

Conclusion

- There was not seen to be a difference in diet quality whether a participant had or had not heard of MyPlate, had or had not looked up MyPlate, and/or had or had not tried a MyPlate plan.
- HEI score is not a significant predictor for having heard of MyPlate, having looked up MyPlate, or having tried a MyPlate plan regardless of if demographics are considered or not.
- Mean total HEI score is not a meaningfully significant predictor of someone having heard of, looked up, or tried MyPlate.

References

1. Bentley, J. (2017). U.S. diets still out of balance with dietary recommendations. United States Department of Agriculture Economic Research Center. Retrieved from: https://www.ers.usda.gov/amber-waves/2017/july/us-diets-still-out-of-balance-with-dietary-recommendations/
2. Bowman, S.A., Clemens, J.C., Friday, J.E., Lynch, K.L., Moshfegh, A.J. (2017). Food Patterns Equivalent Intakes from Food: Mean Amounts Consumed per Individual, What We Eat in America, NHANES 2013-14; Tables 1-4. Worldwide Web Site: Food Surveys Research Group. Retrieved from: www.ars.usda.gov/Services/docs.htm?docid=23868
3. U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2015). *2015 – 2020 Dietary Guidelines for Americans*. 8th Edition. Available at https://health.gov/dietaryguidelines/2015/guidelines/.
4. Food Decision. (2016). Food & Health Survey. International Food Information Council Foundation. Retrieved from: http://www.foodinsight.org/sites/default/files/2016-Food-and-Health-Survey-Report_FINAL1.pdf.
5. Samm, M., Thiagarajah, K. (2015). Consumer awareness of MyPlate ion and its usage. *Journal of the Academy of Nutrition and Dietetics*, 115(9), A78.
6. Tagtow, A., Raghavan, R. (2017). Assessing the reach of MyPlate using national health and nutrition examination survey data. *Journal of the Academy of Nutrition and Dietetics*, 117(2), 181-183.
7. Bassilian, A., Butteroff, H., Plunkett, S. (2017). MyPlate the musical: a program to increase nutrition and physical activity knowledge in elementary schools. *Journal of the Academy of Nutrition and Dietetics*, 117(9), A90.
8. Brown, D.N., O'Conner, L.E., Savaiano, D. (2014). Mobile MyPlate: a pilolet study using text messaging to provide nutrition education and promote better dietary choices in college students. *Journal of American College of Health*, 62(5), 320-327.
9. Tran, T.A., Yang, N., Davis, N., Arden, K., Skovran, D., Shah, B., Thomas, D., Meah, Y. (2017). Nutrition counseling by medical students at a student-run free clinic using goal-setting and the MyPlate method. *Journal of Student-Run Clinics*, 3(1), 1-10.