

SELF-REPORTING A HEALTHY DIET AND DIETARY PRACTICES AMONG  
UNDERGRADUATE NUTRITION AND NON-NUTRITION MAJORS

By

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## **Self-Reporting a Healthy Diet and Dietary Practices among Undergraduate Nutrition and Non-Nutrition Majors**

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### **Abstract**

After our previous study revealed a positive correlation between a high number of nutrition classes and healthy dietary habits, we analyzed the impact of one nutrition class on dietary habits. The objective of this study was to examine the effectiveness of one introductory nutrition class in raising awareness of healthy dietary habits and inspiring healthy changes. Undergraduate students in NSC 170 were given pre-surveys the second week of class ( $n = 364$ ) and post-surveys the last week of class ( $n = 281$ ). Both pre- and post-surveys contained questions about demographic information, meal preparation, dietary habits, and dietary self-assessment. The pre-survey revealed a significant relationship between increased age and self-perception of an unhealthy diet ( $p = 0.066$ ), a significant decrease in fast food meals with age ( $p = 0.018$ ), and increased fruit and vegetable consumption with nutrition majors. The post-survey revealed a significant relationship between increased academic status and self-perception of a healthy diet ( $p = 0.053$ ) and a significant relationship between weight loss and self-perception of a healthy diet ( $p = 0.0125$ ). A comparison of pre- and post-surveys revealed a decrease in the number of fast food meals in juniors and a significant increase in vegetables among nutrition majors.

## **Introduction**

Expanding upon the honor's thesis of Alexandra Franklin, which found a significant correlation between years of education in the nutrition major improved conscious eating habits such as increased vegetable consumption, increased grocery shopping, and decreased in processed food consumption.<sup>1</sup> The objective of my research was to analyze the impact of a single nutrition class on dietary habits. As evidenced by this study and numerous other studies, nutrition education has been proven to be an effective method used to healthily alter dietary habits. For example, thirty-two medical students were given pre- and post-surveys over the span of a year in which the students were educated on cardiovascular curriculum, including heart healthy diets.<sup>2</sup> The study found an improvement in heart healthy dietary habits among the students after cardiovascular nutrition education.<sup>2</sup> Similarly, 7,422 participants in an online nutrition and cooking class over a five-week period were given pre- and post-surveys to analyze the effectiveness of the online classes on their dietary habits.<sup>3</sup> The study found significant positive changes in eating and cooking habits such as increased home-cooked meals, increased fresh ingredients used in meals, and increased self-perception that their meals were healthy.<sup>3</sup> In several instances, nutrition education induces healthy dietary changes.

While nutrition education plays a role in improving dietary habits, the optimal time table of nutrition education to make these changes has not been determined. Since Alexandra Franklin found a significant improvement in dietary habits over a four-year span of nutrition classes, the impact of just one of these nutrition classes was examined. Nutritional Sciences (NSC) 170 is an introductory nutrition course at the

University of Arizona that is open to all majors since it qualifies as a general education course and spans the length of a semester, which is about 15 weeks. This course covers basic nutrition topics such as macronutrients (carbohydrates, proteins, fats), micronutrients (vitamins, minerals), digestion and absorption, and energy balance. Also, the students complete a diet analysis assignment to examine their current dietary habits compared to healthy recommendations. Overall, this class covers the aspects of a healthy diet and the importance of having a healthy diet.

The primary objective of this experiment is to examine the effectiveness of one introductory nutrition class in raising awareness of healthy dietary habits and inspiring healthy changes. Pre- and post-surveys will be distributed at the beginning and end of the semester. Then, the pre-survey and post-survey data will be analyzed both individually and comparatively. There are two main hypotheses for the experiment. First, there will be a significant increase in fruit/vegetable intake and decrease in fast food consumption with those who answer their diet is healthy. Second, fruit and vegetable intakes will increase and fast food consumption will decrease by the end of the NSC 170 course.

## **Methods**

### **Pre-Survey**

364 undergraduate students enrolled in NSC 170 at the University of Arizona participated in the pre-survey. With permission from the instructor, surveys were distributed during class time on Monday, August 29, 2016, the beginning of the second week of classes in the fall semester. Participation in the survey was voluntary and students were informed that participation or lack of participation would not impact their

grade in the course before the surveys were distributed. The surveys contained 18 multiple choice questions regarding participant demographics, living situations, servings of fruit, vegetables, grains, dairy, and protein per day, frequency of fast food purchase/consumption, and dietary self-assessment (see Appendix A). Data from questions 1-15 was analyzed using descriptive statistics, simple logistic regression, simple linear regression, and multiple linear regression.

### Post-Survey

281 undergraduate students from the same NSC 170 class as the pre-survey participated in the post-survey. With permission from the instructor, surveys were distributed during class time on Wednesday, November 30, 2016, the last class of NSC 170 with lecture material. Similar to the pre-survey, participation was optional and students were informed that participation or lack of participation in the survey would not impact their grade in the course before the surveys were distributed. The post-survey contained the same questions as the pre-survey along with two new questions about diet and weight change throughout the semester (see Appendix B). Data from questions 1-17 was analyzed using descriptive statistics, linear regression, Wilcoxon rank-sum tests, and Kruskal-Wallis tests.

## **Results**

### Pre-Survey

#### **Participant Characteristics**

270 females and 94 males participated in the pre-survey. The participants had a mean age of  $18.56 \pm 1.3$ , meaning most participants were freshmen or sophomores in college. The participants were divided into four groups based on major type – nutrition

majors, non-nutrition health majors, non-health majors, and undecided. Of the 364 participants, 36 were nutrition majors, 177 were non-nutrition health majors, 121 were non-health majors, and 29 were undecided.

### **Dietary Habits**

The pre-survey found an association between increased vegetable consumption and age, meaning the older participants were correlated with a higher vegetable intake than younger participants. Also, the pre-survey found a correlation between higher fruit and vegetable consumption and nutrition majors. Of all of the majors, nutrition majors were found to have the highest fruit and vegetable consumption.

### **Meal Preparation**

The pre-survey found that the amount of fast food/no prep meals consumed per week significantly decreased with age ( $p$ -value = 0.018), meaning the older participants consumed less fast food/no prep meals per week than the younger participants. Also, the data found that males consumed more fast food/no prep meals than females. Nutrition and non-nutrition health majors were associated with decreased fast food/ no prep meal consumption than non-health and undecided majors.

### **Dietary Self-Assessment**

When participants were asked, "Do you feel that your diet is healthy?", 55.5% of the participants responded, "Yes & No," 29.1% responded, "Yes," 12.6% responded, "No," and the remaining 2.8% responded, "I don't know." The pre-survey found a significant relationship between increased age and perception that their diet was unhealthy ( $p$ -value = 0.066), meaning the older participants were more likely to describe their diet as unhealthy than the younger participants. Also, the data found that more

males reported their diet as healthy than females. Overall, nutrition majors were most likely to report their diet as healthy, followed by non-nutrition health majors, then non-health majors, and then undecided majors.

### Post-Survey

#### **Participant Characteristics**

218 females and 61 males participated in the post-survey. The participants had a mean age of 19.1, which is slightly older than the mean age of the pre-survey. Of the 281 participants, 21 were nutrition majors, 127 were non-nutrition health majors, 114 were non-health majors, and 18 were undecided.

#### **Dietary Habits**

In the post-survey, males were found to consume more fruit, olives, nuts, and seeds than females ( $p$ -value = 0.05). Additionally, associations between increased year in school and vegetable, fruit, grains, protein, dairy, and olive, nuts, and seed consumption ( $p$ -value = 0.122, 0.096, 0.119, 0.002, 0.022, and 0.044, respectively). This means that the participants further along in school, consumed more food in general since vegetable, fruit, grain, protein, dairy, and olive, nuts, and seed intake consist of all of the categories surveyed.

#### **Meal Preparation**

The post-survey found an association between increased year in school and increased fast food/no prep meal consumption ( $p$ -value = 0.049), meaning that participants further along in school consumed more fast food/no prep meals.

#### **Dietary Self-Assessment**

The post-survey found a marginally significant relationship between increased year in school and perception of a healthy diet ( $p$ -value = 0.053), meaning that more students with a higher academic status felt their diet was healthy. Additionally, more people reported weight loss after completing NSC 170 (Wilcoxon rank sum test,  $p$ -value = 0.0763). There also was a significant relationship between perception of diet and weight change ( $p$  value = 0.0125), meaning that people who lost weight were more likely to feel their diet was healthy, while people who gained weight were more likely to feel their diet was unhealthy.

### Pre- vs. Post-Survey Comparison

#### **Dietary Habits**

Comparing the pre- and post-survey revealed that vegetable consumption varied between the two surveys among the different major types. For non-nutrition health, non-health, and undecided majors, vegetable consumption decreased between the pre- and post-surveys ( $p$ -value = 0.381, 0.14, and 0.559, respectively). For nutrition majors, there was a significant increase in vegetable consumption between the two surveys ( $p$ -value = 0.025). No significant relationships were found among fruit, grains, protein, dairy, or olives, nuts, and seeds intake between the pre- and post-surveys.

#### **Meal Preparation**

When looking at meal preparation while comparing pre- and post-survey results, there were differences among the year in school. Freshman, sophomores, and seniors had an increase in fast food/no prep consumption between the pre- and post-survey ( $p$  value = 0.929, 0.111, and 0.772, respectively). For juniors, there was a significant

decrease in consumption of fast food/no prep meals between the pre- and post-survey (p-value = 0.053).

### **Diet and Weight Changes**

No significant changes in self-perception of diet were found between the pre- and post-surveys. When asked about dietary changes over the semester, common participant responses include: “I have chosen meals more carefully to include more fruits/vegetables;” “I have become more aware about what I eat based on nutrition;” “I eat out more because that is all they have on campus.”

### **Discussion**

#### **Pre-Survey**

Overall, the pre-survey revealed that nutrition majors had the highest fruit and vegetable intake and were more likely to perceive their diet as healthy than all of the other major types. This result logically makes sense because nutrition majors are more likely to be interested in and knowledgeable about healthy eating. It is important to note that only 36 of the 364 participants were nutrition majors, so the small sample size could have interfered with the accuracy of the data. Regarding perception of a healthy diet, non-nutrition health majors were the next likely to perceive their diet as healthy. This result also makes sense because non-nutrition health majors are also likely to be aware of healthy practices. The pre-survey found that nutrition majors were the most likely to have healthy dietary practices, and nutrition and non-nutrition majors were more likely to feel they had a healthy diet.

#### **Post-Survey**

Overall, the post survey revealed more people lost weight than not over the course of NSC 170. Also, there was a significant relationship between weight loss and perception of a healthy diet. This weight loss result is promising as healthier dietary practices are associated with weight loss.

### Pre- vs. Post-Survey Comparison

Despite the weight loss found in the post-survey, there were no significant healthy changes in fruit and vegetable intake and fast food consumption except for increased vegetable consumption among nutrition majors and decreased vegetable consumption among juniors. Non-nutrition health, non-health, and undecided majors actually decreased their vegetable consumption between pre- and post-surveys. This result contradicts the original hypothesis and indicates the course did not make a significant impact on improving healthy dietary habits. Also, freshmen, sophomores, and seniors had an increase in fast food/no prep meal consumption between the pre- and post-survey. Since most freshmen at the University of Arizona live in dorm rooms and do not have a kitchen, it is not surprising that freshmen ate out more. The result of sophomores and seniors increasing fast food/no prep meal consumption is more surprising and also indicates that the course did not make a significant impact on improving healthy dietary habits.

### Conclusion

According to pre-survey results, nutrition student majors ate more fruits and vegetables, less no prep meals, and were more aware their diet is healthy than non-nutrition majors in the same age group. According to post-survey results, there is a significant correlation between weight loss and perception of a healthy diet. Overall,

one introductory nutrition course did not significantly impact fruit and vegetable and fast food consumptions, except increased vegetable consumption in nutrition major students, and decreased fast food consumption among juniors. More research is needed to determine the appropriate amount of nutrition education needed to significantly alter dietary habits towards a healthier direction. Future directions could include examining the effect of the same style of nutrition education in a voluntary setting to determine how much a desire to learn or change impacts dietary habits.

## References

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2. Vargas EJ, Zelis R. Integrating Nutrition Education into the Cardiovascular Curriculum Changes Eating Habits of Second-Year Medical Students. *J Clin Lipidol*. 2014;8(2):199-205. doi: 10.1016/j.jacl.2013.11.006
3. Adam M, Young-Wolff KC, Konar E, Winkleby M. Massive Open Online Nutrition and Cooking Course for Improved Eating Behaviors and Meal Composition. *Int J Behav Nutr Phys Act*. 2015;12:143. doi: 10.1186/s12966-015-0305-2

**Appendix A****Nutritional Research Survey**

1. What is your age?
2. What is your gender?
  - a. Female
  - b. Male
3. What is your ethnicity?
  - a. White
  - b. Hispanic or Latino
  - c. Black or African American
  - d. Native American or American Indian
  - e. Asian / Pacific Islander
  - f. Other: \_\_\_\_\_
4. What is your academic status within your major?
  - a. Freshman
  - b. Sophomore
  - c. Junior
  - d. Senior
5. What is your major and emphasis, if applicable (i.e. Nutrition major with dietetics emphasis, or nutrition major with nutrition emphasis)? Otherwise check "Undecided".
 

Major: \_\_\_\_\_  Undecided

Emphasis: \_\_\_\_\_  Undecided/None
6. Which of the following best describes your living situation?
  - a. Dorm
  - b. Apartment, house, condo, etc.
  - c. With parents/relatives/spouse
  - d. Other: \_\_\_\_\_
7. Approximately how many **times per week** do you purchase and/or consume ready-to-eat food requiring **no** preparation on your part, for **immediate consumption**? Examples of where this can occur may include:
  - The Student Union
  - McDonald's
  - Taco Shop
  - Jack in the Box
  - Paradise bakery
  - A food truck or stand
  - Any restaurant or fast food establishment

I perform this type of activity about \_\_\_\_\_ times per week.

8. Check all that apply to your dietary habits.

- Vegetarian (no meat)  
 Pescetarian (no meat except fish)  
 Lacto-Vegetarian (no meat or eggs, but dairy allowed)  
 Ovo-Vegetarian (no meat or dairy, but eggs allowed)  
 Lacto-Ovo-Vegetarian (no meat, dairy and eggs allowed)  
 Vegan (no animal flesh or products - i.e. no milk, honey, eggs, dairy, meat, fish, etc.)  
 Gluten Free  
 Paleo (centered around foods available to human ancestors - nuts, berries, meat, etc.)  
 I do not consume red meat  
 I do not consume dairy products  
 None of these apply to me

**Use the table below to help you answer questions 9 -14.**

9. How many servings of vegetables do you consume per day? Circle a value below.

0    1    2    3    4    5+

10. How many servings of fruit do you consume per day? Circle a value below.

0    1    2    3    4    5+

11. How many servings of grains do you consume per day? Circle a value below.

0    1    2    3    4    5+

12. How many servings of protein do you consume per day? Circle a value below.

0    1    2    3    4    5+

13. How many servings of dairy do you consume per day? Circle a value below.

0    1    2    3    4    5+

14. How many servings of olives, nuts, or seeds do you consume per day? Circle a value below.

0    1    2    3    4    5+

### Serving Size Examples

Vegetables	Fruit	Grains	Protein	Dairy	Olives, nuts, seeds
1 cup, chopped	1 cup, chopped 1 fruit (orange,	½ bagel ½ cup cooked rice/ pasta	1 ounce meat 1 egg ¼ cup	1 cup milk, yogurt, frozen yogurt 1 ½ oz hard	1 tbsp Peanut Butter ½ ounce nuts (12 almonds)

	apple)	3 cups popcorn 1 slice bread	cooked beans	cheese	
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15. Do you feel that your diet is healthy?
- Yes
  - No
  - Yes & No
  - I don't know
16. When buying fruits and vegetables, do you buy organic produce?
- Always
  - Most of the time
  - Sometimes (a few times in a month)
  - Rarely (a few times in a year)
  - Never
  - I don't know
17. Are you concerned with consuming genetically modified (GM) foods?
- Very much
  - Moderately
  - Not at all
  - I don't know
18. Are you concerned with consuming foods grown with the use of pesticides?
- Very much
  - Moderately
  - Not at all
  - I don't know

**Appendix B****Nutritional Research Survey**

1. What is your age?
2. What is your gender?
  - a. Female
  - b. Male
3. What is your ethnicity?
  - a. White
  - b. Hispanic or Latino
  - c. Black or African American
  - d. Native American or American Indian
  - e. Asian / Pacific Islander
  - f. Other: \_\_\_\_\_
4. What is your academic status within your major?
  - a. Freshman
  - b. Sophomore
  - c. Junior
  - d. Senior
5. What is your major and emphasis, if applicable (i.e. Nutrition major with dietetics emphasis, or nutrition major with nutrition emphasis)? Otherwise check "Undecided".
 

Major: \_\_\_\_\_  Undecided

Emphasis: \_\_\_\_\_  Undecided/None
6. Which of the following best describes your living situation?
  - a. Dorm
  - b. Apartment, house, condo, etc.
  - c. With parents/relatives/spouse
  - d. Other: \_\_\_\_\_
7. Approximately how many **times per week** do you purchase and/or consume ready-to-eat food requiring **no** preparation on your part, for **immediate consumption**? Examples of where this can occur may include:
  - The student union
  - McDonald's
  - Taco Shop
  - Jack in the Box
  - Paradise bakery
  - A food truck or stand
  - Any restaurant or fast food establishment

I perform this type of activity about \_\_\_\_\_ times per week.

8. Check all that apply to your dietary habits.

- Vegetarian (no meat)
- Pescetarian (no meat except fish)
- Lacto-Vegetarian (no meat or eggs, but dairy allowed)
- Ovo-Vegetarian (no meat or dairy, but eggs allowed)
- Lacto-Ovo-Vegetarian (no meat, dairy and eggs allowed)
- Vegan (no animal flesh or products - i.e. no milk, honey, eggs, dairy, meat, fish, etc.)
- Gluten Free
- Paleo (centered around foods available to human ancestors - nuts, berries, meat, etc.)
- I do not consume red meat
- I do not consume dairy products
- None of these apply to me

**Use the table below to help you answer questions 9 -14.**

9. How many servings of vegetables do you consume per day? Circle a value below.  
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10. How many servings of fruit do you consume per day? Circle a value below.  
 0    1    2    3    4    5+
11. How many servings of grains do you consume per day? Circle a value below.  
 0    1    2    3    4    5+
12. How many servings of protein do you consume per day? Circle a value below.  
 0    1    2    3    4    5+
13. How many servings of dairy do you consume per day? Circle a value below.  
 0    1    2    3    4    5+
14. How many servings of olives, nuts, or seeds do you consume per day? Circle a value below.  
 0    1    2    3    4    5+

**Serving Size Examples**

<b>Vegetables</b>	<b>Fruit</b>	<b>Grains</b>	<b>Protein</b>	<b>Dairy</b>	<b>Olives, nuts, seeds</b>
1 cup, chopped	1 cup, chopped 1 fruit	½ bagel ½ cup cooked rice/	1 ounce meat 1 egg	1 cup milk, yogurt, frozen yogurt	1 tbsp Peanut Butter ½ ounce nuts

	(orange, apple)	pasta 3 cups popcorn 1 slice bread	¼ cup cooked beans	1 ½ oz hard cheese	(12 almonds)
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15. Do you feel that your diet is healthy?
- Yes
  - No
  - Yes & No
  - I don't know
16. Has your diet changed for the last 2-3 months?
- Yes  
How has it changed? Please describe:  
\_\_\_\_\_
  - No
17. Have you experienced any weight changes the last 2-3 months?
- Gained weight
  - Lost weight
  - No change
  - I don't know
18. When buying fruits and vegetables, do you buy organic produce?
- Always
  - Most of the time
  - Sometimes (a few times in a month)
  - Rarely (a few times in a year)
  - Never
  - I don't know
19. Are you concerned with consuming genetically modified (GM) foods?
- Very much
  - Moderately
  - Not at all
  - I don't know
20. Are you concerned with consuming foods grown with the use of pesticides?
- Very much
  - Moderately
  - Not at all
  - I don't know