

Nutrition Knowledge and Attitudes Among College Students

Caroline H Geist and Sam R Emerson

Objective: Many people have nearly universal access to nutrition information due to the Internet, yet online sources have a wide range of scientific and journalistic integrity that is difficult to predict. This affects the understanding of the public regarding nutrition information, contributing to nutrition confusion. Given the academic and research-focused setting of universities, they are points of interest regarding the extent of this effect. The purpose of this study was to determine the nutrition knowledge, confusion and misinformation among Oklahoma State University students, relative to their preferred sources of nutritional information.

Methods: A survey questionnaire was designed to evaluate the nutrition knowledge, attitudes, and perceptions of college students. It was composed of multiple-choice questions targeting common sources of nutrition information, what factors participants considered to characterize a healthy dietary pattern and asked them to report their attitudes towards nutrition information and recommendations. The survey was released via Qualtrics, and five thousand OSU undergraduate students were randomly selected and contacted via email for participation.

Results: At the conclusion of the study, 316 responses were recorded. When asked which factors characterize a healthy pattern of eating, prioritizing fruits and vegetables was the most common response (97%), followed by eating fish regularly (65%). When asked which factors characterize a non-healthy pattern of eating, eating sweets was the top response (83%), followed by eating snacks like chips (78%) and juice cleanses (68%). When selecting sources of nutrition information, word of mouth/friends and family was the most common (56%), followed by social media (45%) and health websites like Healthline and MayoClinic (42%). Additionally, the majority (78%) agreed or somewhat agreed that nutrition recommendations are constantly changing, and 55% agreed that nutrition information is confusing.

Summary: The data collected suggests that most Oklahoma State University students rely primarily on informal sources of nutrition information (i.e. word of mouth, social media) and have fairly pessimistic attitudes towards nutrition recommendations and information. However, our data also suggests that most students understand key principles of a healthy dietary pattern like prioritizing fruits and vegetables and drinking only water, and avoiding foods and snacks that are overly sugary, calorically dense, and of little nutritional benefit. Taken together, these findings potentially suggest that despite students' overreliance on untrustworthy sources, the nutrition field has adequately popularized fundamental tenets of healthy eating.

INTRODUCTION

With the advent of the Internet, most of the developed world has nearly universal access to information, including nutrition information. On the other hand, it's relatively easy for any individual to write and upload any kind of content they desire. The fact that there are few filters or restrictions on the accuracy of statements made online, combined with 80% of individuals reporting a reliance on Internet sources for health information, is cause for concern (Funk, 2017).

Motivations for websites or individuals to spread misinformation vary. Many health websites are funded by or contain ads for nutrition and health products, which may warp the type and quality of information they share. News sites may misinterpret or misrepresent research findings, whether accidentally or for the purposes of generating interest and attracting readers. Some websites or individuals may be working from an already flawed foundation and are simply presenting information that meets their confirmation bias (Klurfeld, 2000). This bias is common in non-credentialed individuals writing food blogs. A 2018 review of food blogs found that blogs written by Registered Dietitians were far more likely to encourage tenets including moderation and include citations for health claims, compared to non-RD bloggers, who focus on restrictive and fear-based dialogues and would not cite sources for health claims (Chan, 2018).

The mass of unregulated nutrition sources online naturally generates contradictory messages, some of them myth or pseudoscience. A necessary skill for filtering through

unreliable sources is health literacy, the ability to locate and understand trustworthy healthcare information, and use that information to make appropriate health decisions (Paasche-Orlow, 2005).

The importance of health literacy to the quality of health of Americans has increasingly been recognized in recent decades, and concerns about the health literacy of Americans has also been increasing (Paasche-Orlow, 2005). Because of this, it has been included as one of the five primary goals for Healthy People 2030. The goal states that individuals should “attain health literacy” to improve health, quality of life, and longevity (Healthy People 2030, 2020).

While a specific estimate is difficult to establish, several studies have determined that the lack of health literacy is an issue that needs to be addressed (Institute of Medicine, 2004; Paasche-Orlow, 2005). The National Adult Literacy Survey profiled 26,000 individuals across 12 states to examine the general literacy of US adults, a skill that is foundational to health literacy. The survey found that half of US citizens have either limited or low literacy ability (Kirsch, 1993). This indicates that the majority of American adults – those with average or lower literacy skills – will have difficulty understanding health information. And those who are able to read nutrition information may not know how to find reliable sources, or be able to interpret it accurately. This difficulty is further exacerbated by the extent of nutrition misinformation that can be found online, and even the nature of nutrition as a research field itself.

Research can be difficult for many to understand and apply to their own life and behaviors. Even those with moderate health literacy may find themselves confused by seemingly conflicting headlines, reflected in common attitudes like the idea that “nutrition is always changing.” For example, an individual might read an article reporting recent research that drinking wine reduced risk of heart disease; then the next day, read about how alcohol, including red wine, increases risk of breast cancer. These leave the individual unsure of whether they should drink red wine or not, creating feelings of uncertainty.

From this uncertainty stems pessimistic feelings about the effect of nutrition on health, and toward the reliability of science and the field of nutrition in general. These pessimistic attitudes are linked to a decreased adherence to not only nutrition recommendations related to the original source of uncertainty (in this example, drinking red wine) but towards other, unrelated recommendations as well (for example, consuming whole grains) (Nagler, 2014). Further, nutrition confusion is linked to backlash towards nutrition information and health professionals - but not towards nutrition information from social media and health websites (Vijaykumar, 2021). Nutrition misinformation and confusion have ripple effects on an individual’s life and can directly impact their health. The low health literacy of the population, in combination with the widespread misinformation online, makes for a concerning combination.

There is an association of higher health literacy with higher education, making college students a population of interest, especially given the popular association with poor dietary quality (van der Heide, 2013). A 2006 study found that the average college student diet was high in fat and sodium and low in fruits and vegetables, and that fast food was especially common. The students rarely met nutrient recommendations or dietary guidelines (Davy, 2006) It's also typical for students to engage in other unhealthy dietary behaviors including unhealthy dieting, meal skipping, and engaging in minimal physical activity, increasing risk for diseases including heart disease and cancer. While these behaviors are present across all four years of study, they are most common among first-year students (Lua, 2012). There are a variety of factors that play a role in these dietary habits. Students cite reasons such as a lack of time, convenience, and taste as primary factors affecting their dietary decisions (Davy, 2006). Other factors include stress and the cost-effectiveness of less healthy junk foods (Sogari, 2018).

Factors that played a role in enabling healthy food choices included nutrition knowledge and the attitudes and behaviors of friends and family around them (Sogari, 2018). Individuals who ranked high on a diet quality score cited their knowledge of the Dietary Guidelines for Americans and other nutrition information (Kolodinsky, 2007). This suggests that improving nutrition knowledge and improving nutrition attitudes will promote healthful choices in individuals and those around them.

Despite the presence of disease-promoting behaviors, studies show that many college students may understand a healthy diet; or at least understand aspects of it. For example, a 2006 study found that 94% of students agreed that it is important to eat a variety of foods for good health (Davy, 2006). Some students express interest in eating a healthier diet, but “believe it to be impossible to eat a healthy, balanced diet while in college, or they simply do not know how” (Boster, 2022). Beyond this, it is not known more specifically what health and nutrition beliefs and attitudes are most common among college students, and more research is needed, a gap this study hopes to fill.

METHODS

A survey was designed to assess college students’ knowledge of and attitudes toward nutrition. The first section of the survey targeted what participants considered to make up a healthy diet, and what didn’t. The second section of the survey included potentially controversial nutrition statements, and participants were asked to rate how much they agreed or disagreed with the suggested statement. The third section of the survey asked participants which diet programs they had attempted, and which of those same diet programs they considered to be healthy. And finally, the last section of the survey asked participants to identify which sources of nutrition information they relied on.

The first section was designed with the goal of assessing the qualities that individuals considered to be particularly healthful, and what was considered particularly unhealthy. The same list of characteristics was provided, and participants were asked which characterized a healthy and an unhealthy diet.

Criteria included the following:

1. Eating sweets like cookies
2. Eating snacks like chips
3. Following juice cleanses
4. Restricting carbs
5. Limiting meat
6. Taking supplements
7. Choosing low-fat dairy
8. Drinking only water
9. Eating fish regularly
10. Prioritizing vegetables and fruits

The second section of the survey contained a Likert scale with ten statements related to nutrition, and participants were asked to indicate whether they agreed, somewhat agreed, were neutral, somewhat disagreed, or disagreed with the statement. These statements were created with the goal of determining public attitudes toward nutrition

information and opinions and beliefs regarding controversial nutrition-related topics.

The first category, attitudes toward nutrition information included two statements:

1. Nutrition recommendations are constantly changing.
2. Nutrition information is confusing.

The second category determined public opinions and beliefs regarding controversial nutrition topics, and included the following statements:

1. There are no “good” or “bad” foods.
2. Some people need to reprogram their metabolism to lose weight.
3. Every food can be included in a healthy diet if eaten in moderation.
4. It’s best to lose fat as fast as possible.
5. Detoxes and cleanses help rid the body of toxins.
6. Having too much body fat increases risk for heart disease.
7. Supplements are an effective way to make up for an unhealthy diet.
8. Effective weight loss diets convert fat into muscle.

The third section of the survey included a list of diet programs and participants were asked to first identify which programs they had attempted, and which they considered to be healthy. The list of diet programs included:

1. The DASH Diet
2. Atkins
3. Noom

4. Whole 30
5. Weight Watchers
6. Mediterranean Diet
7. Ketogenic Diet
8. Intermittent Fasting

The fourth section provided a list of potential nutrition information sources, and participants were asked to identify which ones they most typically relied on for their nutrition information. The list of sources included:

1. Personal trainer
2. Healthcare professional
3. Television
4. Registered dietitian
5. Nutritionist
6. Classes
7. Doctor
8. Books
9. Health websites
10. Social media
11. Word of mouth (family and friends)

The survey was then distributed via Qualtrics. The email addresses of five thousand random Oklahoma State University students were selected and contacted for participation. The survey was opened for two weeks, and upon closing, 316 responses were recorded.

RESULTS

Figure 1 demonstrates the results for the first question about characteristics of a healthy diet. Of the most common responses, 97% of respondents considered prioritizing fruits and vegetables to be part of a healthy diet, 65% selected eating fish regularly, and 61% selected drinking only water. Of the least common responses, only 7% selected following juice cleanses, 6% selected eating snacks like chips, and similarly 6% selected eating sweets like cookies.

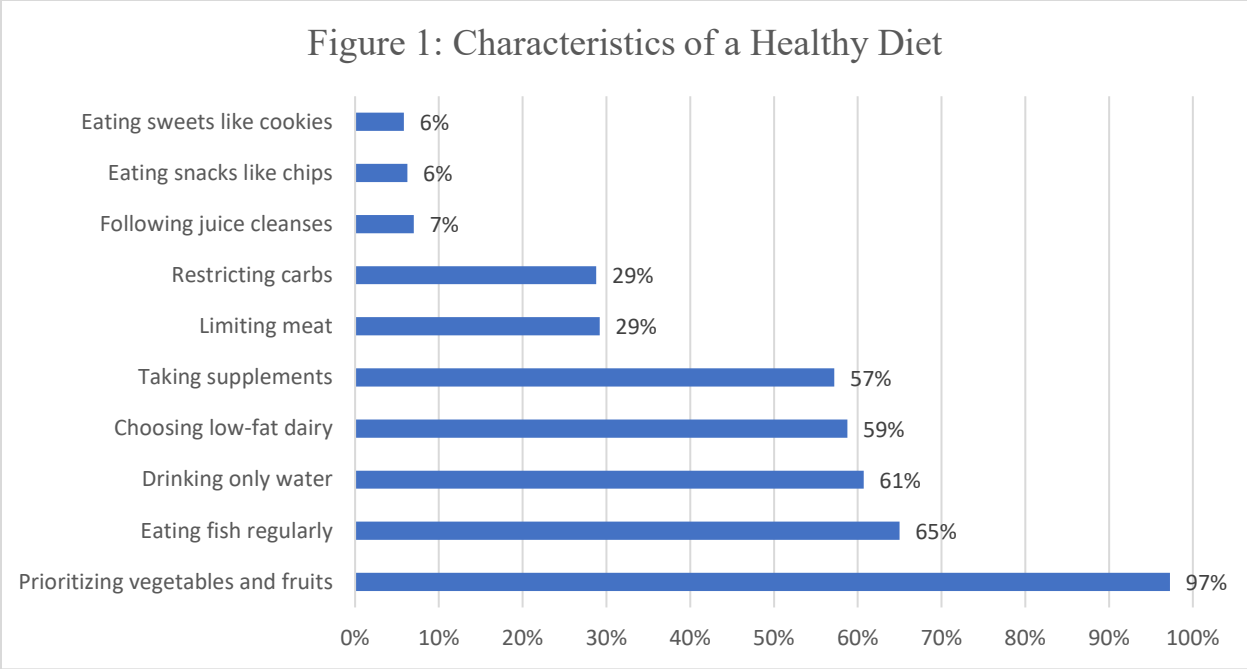


Figure 2 depicts the responses for the second question regarding elements participants considered characteristic of a non-healthy diet. The most common choices were eating sweet like cookies (83%), eating snacks like chips (78%), and following juice cleanses (68%). 6% of respondents indicated that choosing low-fat dairy was part of a non-healthy diet, 2% indicated eating fish regularly, and only 1% indicated that prioritizing vegetables and fruits were part of an unhealthy diet.

Figure 2: Characteristics of a Non-Healthy Diet

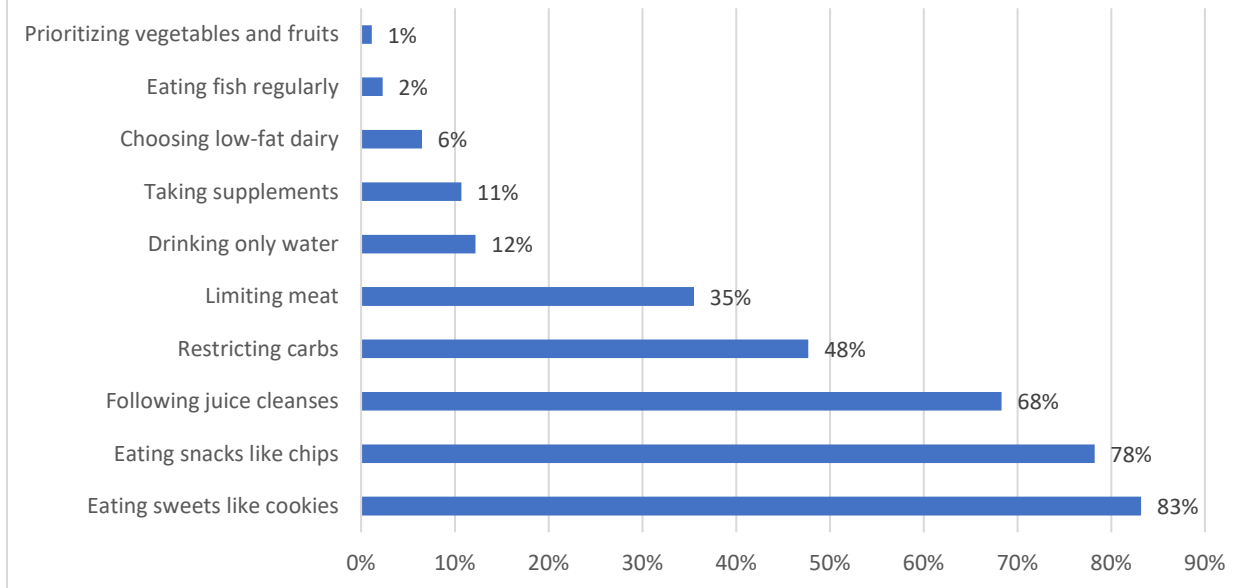


Figure 3 depicts the responses to the Likert scale about nutrition-related statements. Of the first statement, “effective weight loss diets convert fat into muscle,” 33% of respondents agreed or somewhat agreed, and 43% disagreed or somewhat disagreed. 71% of respondents disagreed that supplements effectively make up for an unhealthy diet. 93% of respondents agreed or somewhat agreed that excess body fat increases risk for heart disease, with 60% of those completely agreeing. When asked whether detoxes and cleanses help rid the body of toxins, 59% of respondents disagreed or somewhat disagreed. 91% of respondents disagreed or somewhat disagreed that it’s best to lose fat as fast as possible, with 60% of those completely disagreeing and only 3% disagreeing or somewhat disagreeing. 87% of respondents agreed or somewhat agreed that every food can be included in a healthy diet if eaten in moderation. When asked if some

people need to reprogram their metabolism to lose weight, 40% agreed or somewhat agreed, 27% of respondents were neutral, and 46% disagreed or somewhat disagreed. 78% agreed or somewhat agreed that nutrition recommendations are constantly changing, with only 11% disagreeing or somewhat disagreeing. 55% agreed or somewhat agreed that nutrition information is confusing, and 26% of respondents disagreed or somewhat disagreed.

FIGURE 3: NUTRITION STATEMENTS

■ Neutral ■ Somewhat agree ■ Agree ■ Somewhat disagree ■ Disagree

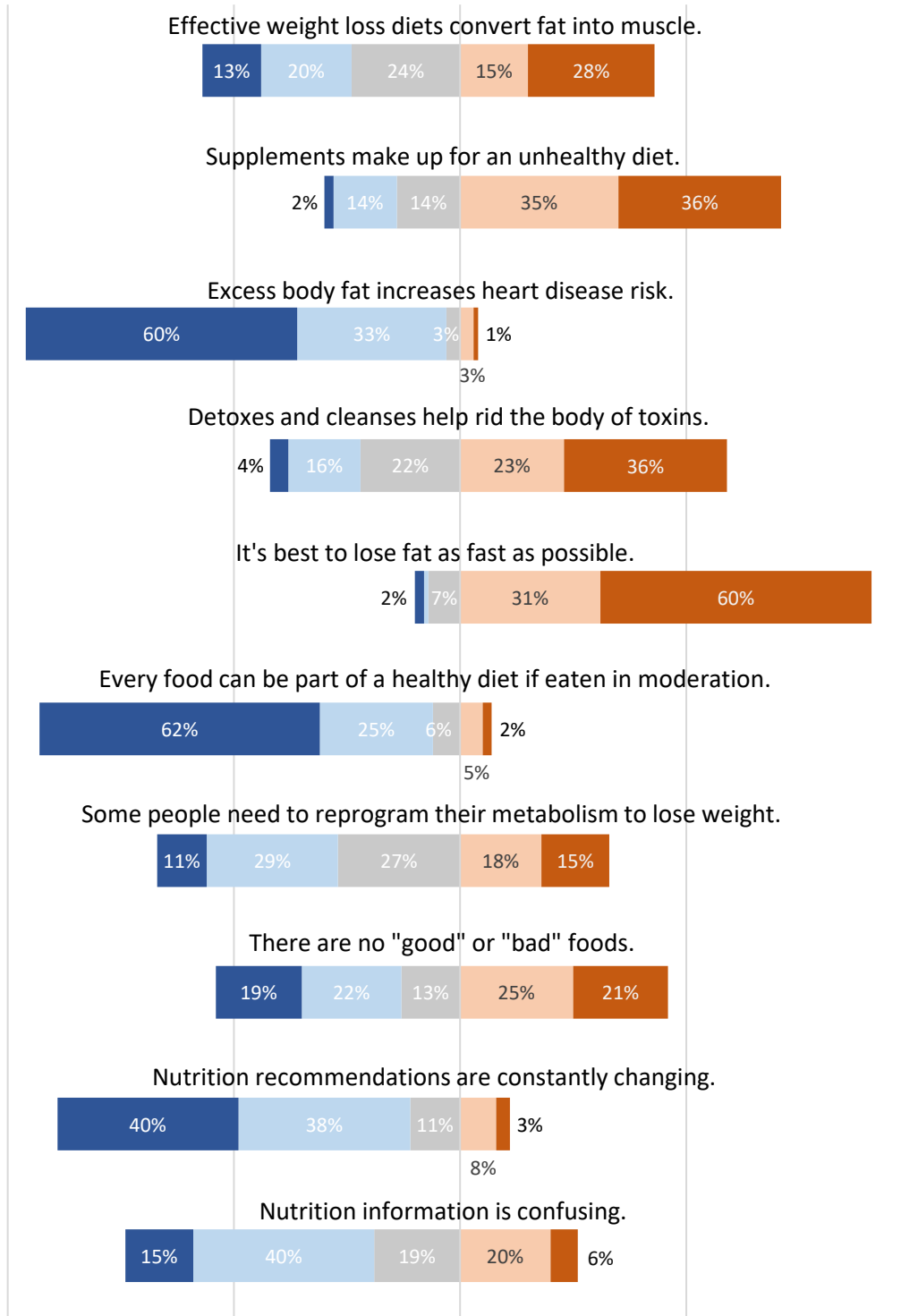


Figure 4 demonstrates the most common attempted diet programs among respondents. Intermittent fasting was the most popular, as 60% of individuals had attempted it before. Additionally, 28% have followed the Ketogenic diet, making it the second most popular, followed by the Mediterranean diet at 13%. The least common diet was the DASH diet, which only 3% of respondents reported previously attempting it.

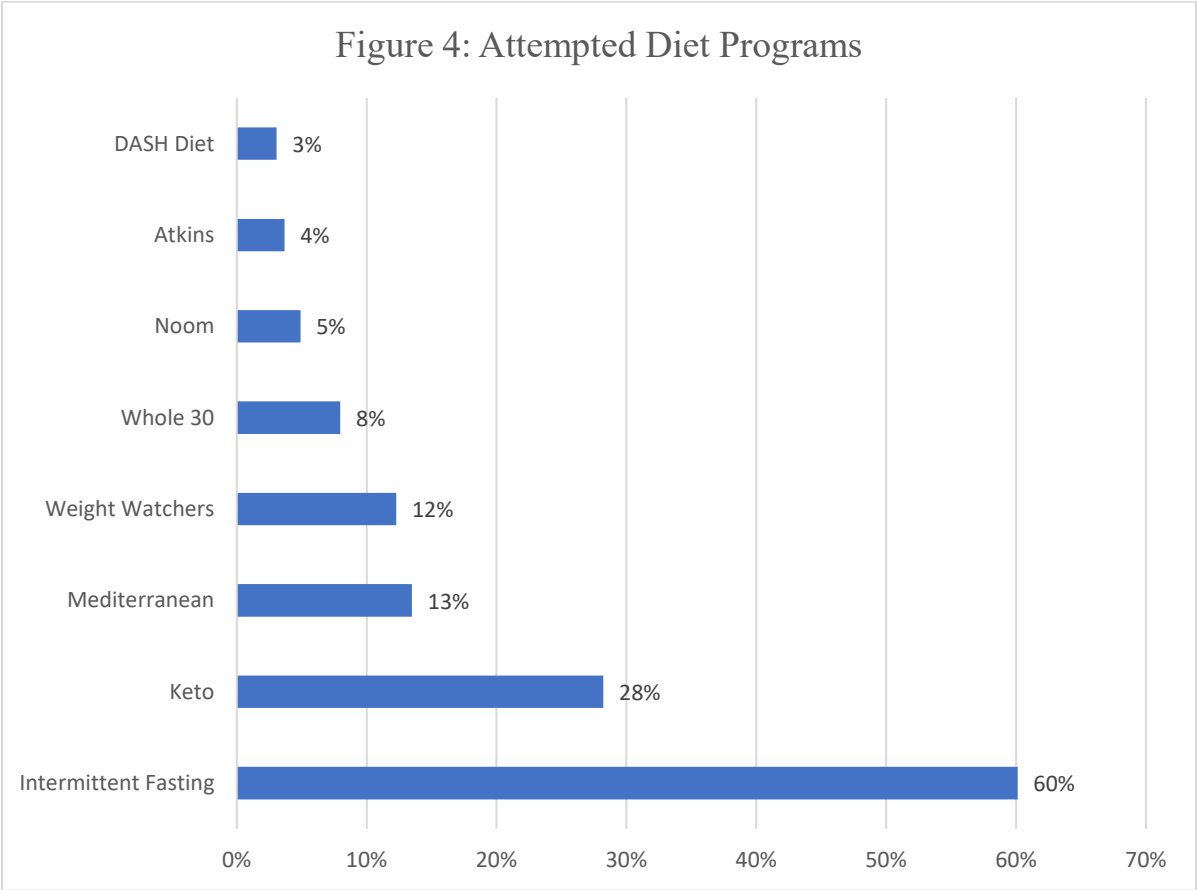


Figure 5 depicts the diet programs that individuals considered to fit into a healthy lifestyle. The most common response was the Mediterranean diet, as 49% of respondents considered it to be healthy. 27% of respondents considered intermittent

fasting to be healthy, and 24% selected Weight Watchers. The least common response was the Atkins diet, as only 7% of respondents considered it healthy.

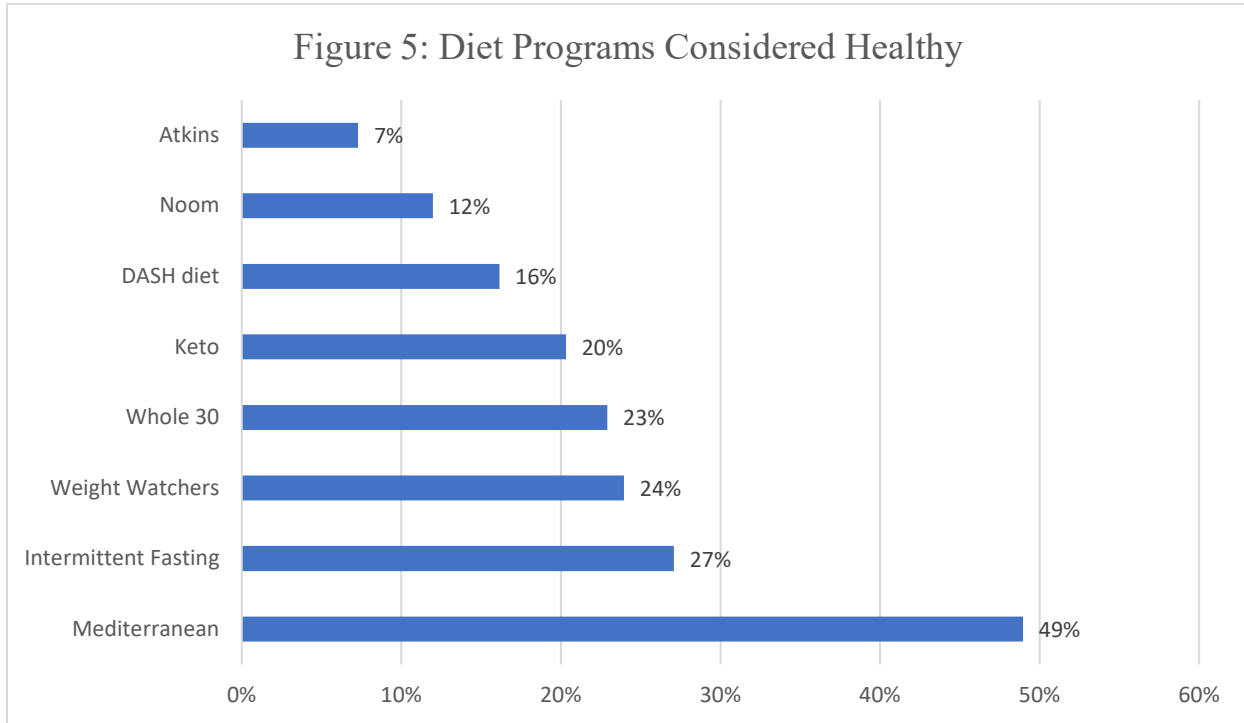
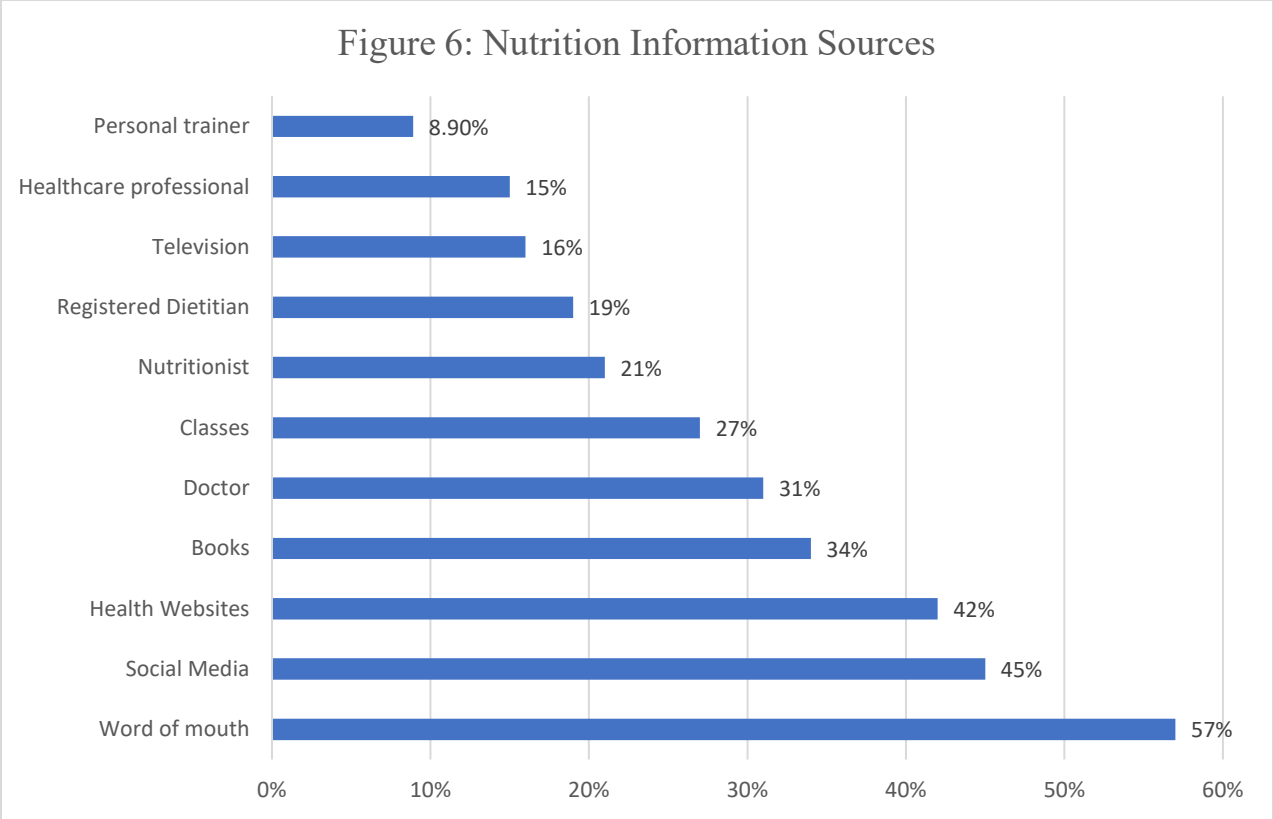


Figure 6 demonstrates the most popular sources for nutrition information among college students. The most common source of nutrition information was word of mouth through friends and family, which 57% of participants selected, followed by social media, which 45% of participants rely on for nutrition information. 42% of participants report using health websites, and the least popular response was personal trainer, which only 8.9% of individuals selected.



DISCUSSION

Oklahoma State University students primarily rely on informal sources of nutrition information, like word of mouth and social media. They also tend to rely on online sources, including social media and health websites.

The nutrition knowledge of students varied. While they all recognized key factors of healthy diets like fruits and vegetables, they were split on certain tenets, like whether effective weight loss converts fat to muscle, with 57% agreeing or remaining neutral, as seen on Figure 3. Additionally, 42% were neutral or agreed that juice cleanses rid the body of toxins. And while many agreed that the Mediterranean diet was healthy, other

diets that are highly accepted in the nutrition field like DASH and Weight Watchers were not commonly chosen as healthy diets by participants.

The attitudes of college students towards nutrition information tended to be pessimistic, as the majority found nutrition information confusing and agreed that recommendations were always changing.

Put together, these findings suggest that despite the overreliance on untrustworthy sources, college students have a decent grasp on nutrition fundamentals and dietary guidelines, indicating that these tenets have been successfully popularized by the nutrition field. However, it appears that health literacy in college students may be a prevalent issue, as more complex tenets such as ridding the body of toxins or effective weight loss were difficult for students to understand. Future research should more precisely measure the extent of health literacy and confusion amongst college students, and the effect that this has on their eating behaviors.

REFERENCES

- Adamski M, Truby H, M. Klassen K, Cowan S, Gibson S. Using the Internet: Nutrition Information-Seeking Behaviours of Lay People Enrolled in a Massive Online Nutrition Course. *Nutrients*. 2020; 12(3):750. <https://doi.org/10.3390/nu12030750>
- Chan, T., Drake, T., & Vollmer, R. L. (2018). Qualitative Comparison of Nutrition Content and Advice From Registered Dietitian and Non-Registered Dietitian Bloggers. *Journal of Nutrition Education and Behavior*, 50(7), S105–S106. <https://doi.org/10.1016/j.jneb.2018.04.136>
- Davy, S. R., Benes, B. A., & Driskell, J. A. (2006). Sex Differences in Dieting Trends, Eating Habits, and Nutrition Beliefs of a Group of Midwestern College Students. *Journal of the American Dietetic Association*, 106(10), 1673–1677. <https://doi.org/10.1016/j.jada.2006.07.017>
- Funk, C. (2017). Mixed messages about public trust in science. *Issues in Science and Technology*, 34(1), 86-88. Retrieved from <http://argo.library.okstate.edu/login?url=https://www.proquest.com/scholarly-journals/mixed-messages-about-public-trust-science/docview/2177530522/se-2?accountid=4117>
- Institute of Medicine. 2004. *Health Literacy: A Prescription to End Confusion*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/10883>.
- Kirsch I, Jungeblut A, Jenkins L, Kolstad A. Adult Literacy in America: A First Look at the Findings of the National Adult Literacy Survey. Washington, DC: National Center for the Education Statistics, U.S. Department of Education; 1993.
- Klurfeld, D. M. (2000) Nutrition on the Net, *Journal of the American College of Nutrition*, 19:1, 1-2, DOI: [10.1080/07315724.2000.10718906](https://doi.org/10.1080/07315724.2000.10718906)
- Kolodinsky, J., Harvey-Berino, J. R., Berlin, L., Johnson, R. K., & Reynolds, T. W. (2007). Knowledge of Current Dietary Guidelines and Food Choice by College Students: Better Eaters Have Higher Knowledge of Dietary Guidance. *Journal of the American Dietetic Association*, 107(8), 1409–1413. <https://doi.org/10.1016/j.jada.2007.05.016>
- Lua, P. L., & Wan Putri Elena, W. D. (2012). The impact of nutrition education interventions on the dietary habits of college students in developed nations: a brief review. *The Malaysian journal of medical sciences : MJMS*, 19(1), 4–14.
- Nagler R. H. (2014). Adverse outcomes associated with media exposure to contradictory nutrition messages. *Journal of health communication*, 19(1), 24–40. <https://doi.org/10.1080/10810730.2013.798384>

- Paasche-Orlow, M.K., Parker, R.M., Gazmararian, J.A., Nielsen-Bohlman, L.T. and Rudd, R.R. (2005), The Prevalence of Limited Health Literacy. *Journal of General Internal Medicine*, 20: 175-184. <https://doi.org/10.1111/j.1525-1497.2005.40245.x>
- Sogari, G., Velez-Argumedo, C., Gómez, M. I., & Mora, C. (2018). College Students and Eating Habits: A Study Using An Ecological Model for Healthy Behavior. *Nutrients*, 10(12), 1823. <https://doi.org/10.3390/nu10121823>
- Van der Heide, I., Wang, J., Droomers, M., Spreeuwenberg, P., Rademakers, J., & Uiters, E. (2013) The Relationship Between Health, Education, and Health Literacy: Results From the Dutch Adult Literacy and Life Skills Survey, *Journal of Health Communication*, 18:sup1, 172-184, DOI: [10.1080/10810730.2013.825668](https://doi.org/10.1080/10810730.2013.825668)
- Vijaykumar, S., McNeill, A., & Simpson, J. (2021). Associations between conflicting nutrition information, nutrition confusion and backlash among consumers in the UK. *Public Health Nutrition*, 24(5), 914-923. doi:10.1017/S1368980021000124