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The Correlation Between a Nutritious Diet and a Ouachita Baptist University Student's Academic Performance

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Abstract

Background: Current research indicates that college students who are participating in little to no exercise and consuming an unbalanced diet heavily influenced by processed food and limited amounts of whole grains, fruit, vegetables, lean protein, and dairy can lead to poor academic performance. **Objective:** To determine whether a positive correlation exists between a balanced diet, frequent exercise, and a college student's academic performance at Ouachita Baptist University (OBU). **Design:** In August 2021, following the Institutional Review Board (IRB) approval, a research design involving the distribution of a questionnaire was given to students taking nutrition classes within OBU's School of Natural Sciences. Over a two-month duration, the students' questionnaire data was collected and analyzed. **Participants/Setting:** A sample population of 50 students were selected. The population comprised of both male and female adult students who were from different majors and classifications at OBU. **Statistical Analysis:** Microsoft Excel® spreadsheet software analyzed the students' demographic, focusing ability, and FFQ data. **Results:** Fifty-three percent of the 17 students who could easily focus consumed a nutrient-dense diet, while 91% of the 23 students who could not easily focus consumed a less nutrient-dense diet. **Conclusion:** Findings are consistent with the current literature that states there is a positive correlation with improved college academic performance and the frequent consumption of a nutrient-dense diet.

Introduction

As an incoming college student moves away from home and shifts from a dependent state to a state of autonomy, they have more responsibilities such as making proper dietary choices.^{1,3} Even though most college students have a basic understanding of nutrition, eating a nutritiously balanced diet consisting of protein, fat, carbohydrates, and micronutrients can be challenging, especially when they have the newfound freedom to consume unlimited amounts of fast food, processed snacks, sweetened beverages, and buffet-style cafeteria food. Additionally, with the stress of adjusting to a new environment and trying to perform well with an increased course load, a college student will also lower their priority for a healthy amount of exercise. Due to a student's unbalanced diet and decreased exercise activity, it can often negatively impact their focus ability and academic performance.^{1,2, 3-5}

A positive correlation would demonstrate a downward trend for their academic performance and consumption of a less nutrient-dense diet and an upward trend for their academic performance and consumption of a nutrient-dense diet.

A study conducted on 100 undergraduate students, ages 19-23, who attended the Government Degree College in Dharmanagar, North Tripura, concluded that a college student's academic achievement strongly correlated with an optimally nutritious diet.⁶ Specifically, students deficient in Vitamin C, Vitamin A, Riboflavin, Thiamine, and essential Omega-3 fatty acids had poor academic performance because these nutrients are critical in cognitive development and function.⁶

When reviewing previous studies regarding the relationship between a nutrient-dense diet and a student's academic performance, an abundant number of studies focus on students ranging from Pre-K to high-school grade levels.^{7,8,9-10} However, the studies performed on university students and their diet-related academic performance have remained limited.¹⁰ The purpose of this study was to determine whether a positive correlation exists between a nutrient-dense diet and a OBU student's academic performance regarding focus ability.

Methodology

The Institutional Review Board (IRB) received the research proposal in August 2021, and they approved it without any modifications. Before the study, the current literature was reviewed and analyzed to understand further how inadequate nutrition can potentially result in a college student's poor academic performance. Additionally, to abide by the IRB's requirements, each participant received an informed consent that they would sign prior to the administration of the study. The form allowed all the surveyed students the option to choose whether they wanted to participate.

The sample population selected were 50 students taking nutrition classes taught within OBU's School of Natural Sciences. The population comprised of both male and female adult students, who were from different majors and classifications. Brief demographic and food frequency questionnaires (FFQ) were developed and passed to the students. The demographic questionnaire included eight questions asking them about their focus ability and whether they had been medically diagnosed with attention deficit hyperactivity disorder (ADHD). The FFQ's items included a wide array of both highly processed and wholesome foods from each of the five food groups: grains, fruits, vegetables, protein, and dairy. It also included a section asking about the frequency of multi-vitamin/mineral intake (MVM), fish oil supplement intake, and exercise.

After the students completed the survey, data was compiled through Microsoft Excel® spreadsheet software and analyzed for demographic data: gender, race, and classification (Table 1). The data were separated into two primary groups: those who answered, "I find it easy to focus" and those who answered, "I find it difficult to focus" Also, using Microsoft Excel for the FFQ, an emphasis was placed on each group's frequency of consuming processed food, whole grains, fruit, vegetables, protein, and dairy, which were divided into two subgroups: nutrient-dense and less nutrient-dense (Table 2). For the purposes of this research, one can define nutrient-dense as a diet heavily influenced by the five food groups and minimal consumption of processed food, such as cookies, candy, ice cream, potato chips, and sweetened beverages. Less nutrient-dense can be defined as extensive consumption of the previously mentioned processed food items and minimal consumption of the five food groups. Those who answered "yes" to the question regarding whether they have a medical diagnosis of ADHD did not meet the inclusion criteria and were eliminated to prevent the possibility of skewed data, as their inability to focus is based on a medical diagnosis and not potentially influenced by diet.

| Participant Demographics | n |
|-------------------------------|----|
| Gender | |
| Male | 25 |
| Female | 25 |
| Race/Ethnicity | |
| Caucasian | 41 |
| African American | 4 |
| Asian | 1 |
| Hispanic | 1 |
| Other/Mixed Race or Ethnicity | 3 |
| Classification | |
| Freshman | 8 |
| Sophomore | 19 |
| Junior | 12 |
| Senior | 11 |

Table 1. Summary table of OBU Department of Natural Sciences students (n=50) grouped according to demographic data.

Results

A total of 50 students, comprised of 25 males and 25 females, completed the survey and FFQ. Out of the 50 students, 82% were Caucasians, 8% were African Americans, 2% were Asian, 2% were Hispanic, and 6% were of mixed race/ethnicity. The student sample population included 8 freshmen, 19 sophomores, 12 juniors, and 11 seniors (Table 1).

Table 2 demonstrates that 18 students answered that they find it easy to focus on homework assignments and exams. Of those 18 students, only one student had a previous medical diagnosis of ADHD. As a result, they were excluded from the data leaving 17 remaining students. Of those 17 remaining students, 53% consumed a nutrient-dense diet, while 47% consumed a less nutrient-dense diet (Figure 2). All 17 students actively participated in regular exercise, and 82% of the 17 students took a MVM supplement, a fish oil supplement, or both MVM and fish oil supplements.

Thirty-two students answered that they find it difficult to focus when completing homework assignments and exams. Of those 32 students, 9 were medically diagnosed with ADHD, which meant they did not meet the inclusion criteria, leaving 23 remaining students. Ninety-one percent of the 23 students consumed a less nutrient-dense diet, while 9% consumed a nutrient-dense diet (Figure 1). Ninety-one percent of the 23 students engaged in regular exercise, and 48% of the 23 students took a MVM supplement, a fish oil supplement, or both MVM and fish oil supplements.

Table 2. Comparing the focus ability of OBU* Department of Natural Sciences' students (N = 40) related to nutrient-dense food consumption, exercise frequency, and supplement usage.

| | Easy to Focus n | Difficult to Focus n |
|--|-----------------|----------------------|
| Total Number of Students (50% Male and 50% Female) | 18 | 32 |
| Total Number of Students Medically Diagnosed with ADHD* | 1 | 9 |
| Total Number of Students for Analysis (Not Medically Diagnosed with ADHD) | 17 | 23 |
| Total Number of Students Consuming Nutrient-Dense Food | 9 | 2 |
| Total Number of Students Consuming Less Nutrient-Dense Food | 8 | 21 |
| Total Number of Students Regularly Exercising | 17 | 21 |
| Total Number of Students Consuming a MVM* and Fish Oil Supplement | 14 | 11 |

* OBU = Ouachita Baptist University
* ADHD = Attention Deficit Hyperactivity Disorder; medically diagnosed students were excluded from the final results of the study.
* MVM = Multivitamin/Mineral

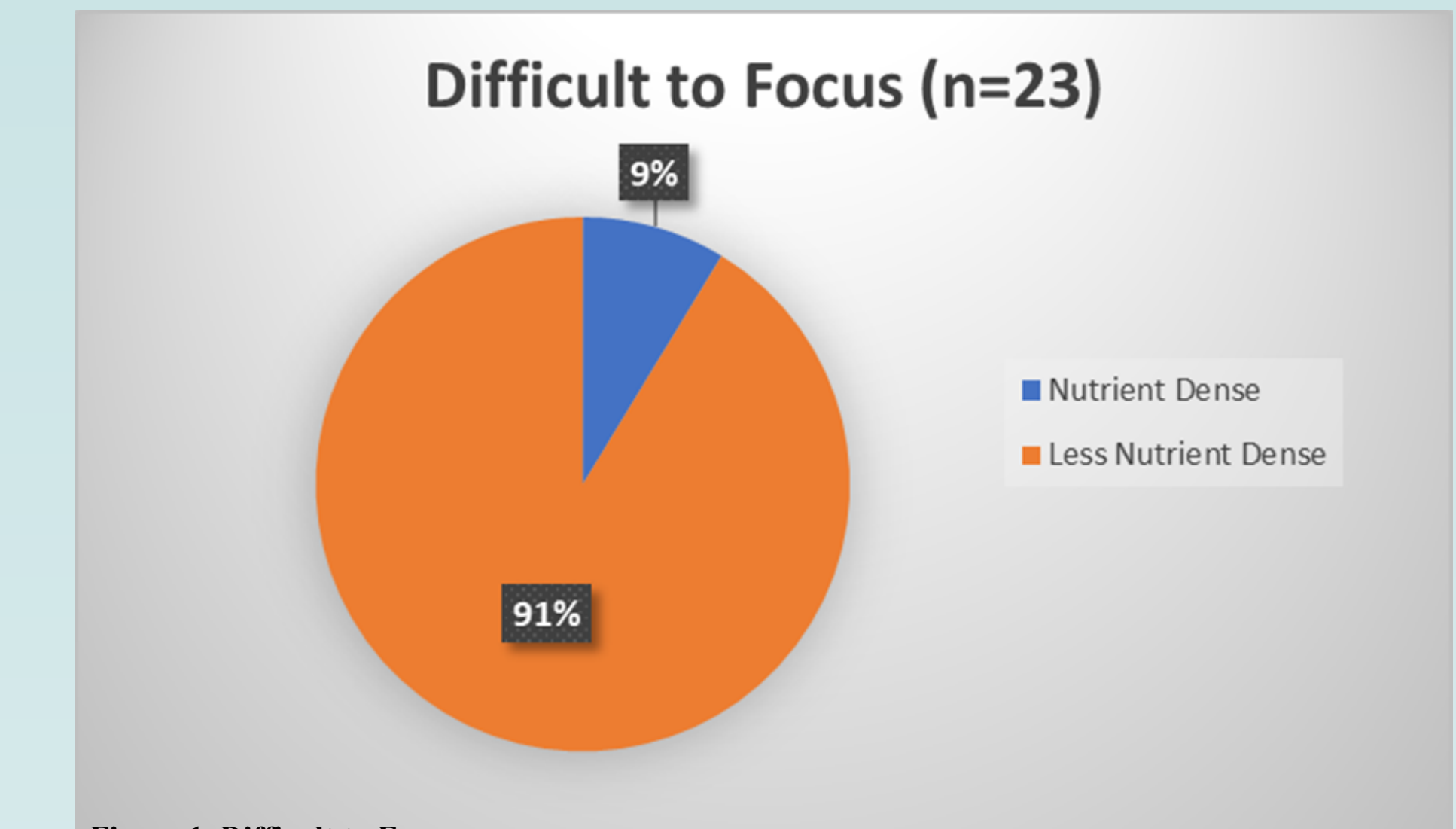


Figure 1. Difficult to Focus

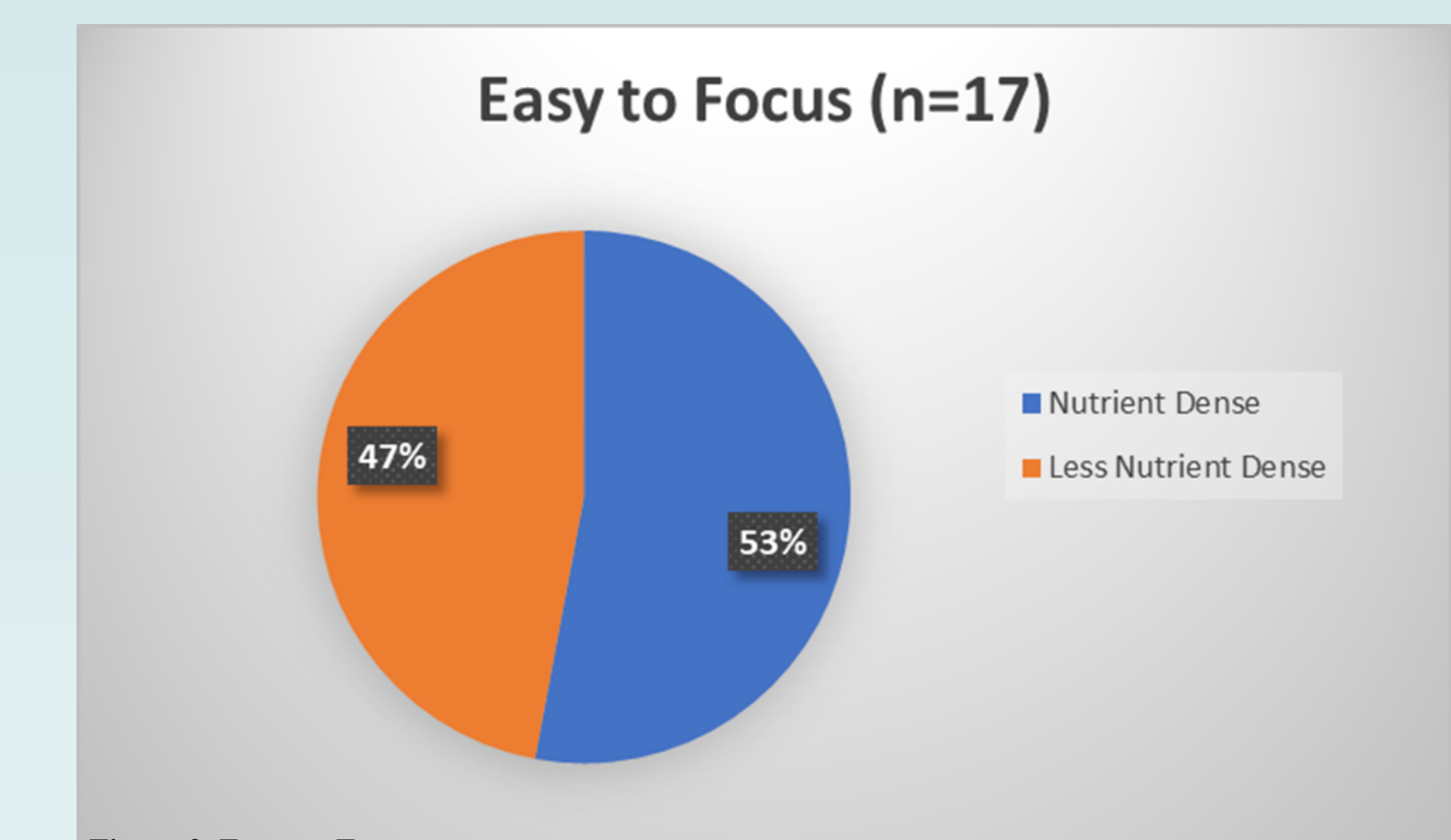


Figure 2. Easy to Focus

Conclusion

This study suggests that following a nutrient-dense diet is essential for optimal academic performance. Eating more whole grains, fruits, and vegetables may be the key to academic achievement. Furthermore, regular exercise may play an important role in academic achievement. The findings of this research study are consistent with the current literature that states there is a positive correlation with improved college academic performance and the frequent consumption of a nutrient-dense diet.

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Ability to Focus on Assignments and Exams
Please circle your answer.

- Are you at least 18 years of age?
Yes No
- What is your gender?
a. Male
b. Female
- What is your race?
a. African American
b. Caucasian
c. Hispanic
d. Asian
e. Other
- What is your classification?
a. Freshman
b. Sophomore
c. Junior
d. Senior
- Are you a student at the School of Natural Sciences at Ouachita Baptist University?
Yes No
- Have you ever been medically diagnosed with ADHD?
Yes No
- While completing homework assignments, how do you rate your ability to focus?
a. I find it easy to focus
b. I find it difficult to focus
- While taking an exam, how do you rate your ability to focus?
a. I find it easy to focus
b. I find it difficult to focus

| | Never | Once per day | More than once per day | 1-3 times per week | 4-6 times per week |
|-------------------------------|-------|--------------|------------------------|--------------------|--------------------|
| Beef or Poultry | | | | | |
| Eggs | | | | | |
| Fish | | | | | |
| Processed Meat | | | | | |
| Dairy | | | | | |
| Whole-grain Bread | | | | | |
| White Bread | | | | | |
| Cereal or Oatmeal | | | | | |
| Fruit or Fruit Juice | | | | | |
| Vegetables or Vegetable Juice | | | | | |
| Margarine or Butter | | | | | |
| Potato Chips | | | | | |
| Sweets/baked goods | | | | | |
| Ice Cream | | | | | |
| Soda | | | | | |
| Water | | | | | |
| Multivitamin Supplement | | | | | |
| Fish Oil Supplement | | | | | |
| Exercise | | | | | |