

RELATIONSHIP BETWEEN CARDIOVASCULAR DISEASE RISK AND FAST
FOOD CONSUMPTION IN UNDERGRADUATE HONORS COLLEGE STUDENTS

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Introduction

Cardiovascular Disease (CVD) has been reported as the leading cause of death worldwide. Common risk factors for CVD include dyslipidemia, obesity, diabetes mellitus, and hypertension. Unhealthy diet in the form of excessive of fast food consumption has been proven to cause CVD. Fast food consumption has increased over the past decades⁹. Over 25 percent of Americans consume fast food every day¹. Fast food is food that is prepared quickly and easily for the purpose of consuming a quick meal². Often, especially in the college age cohort, fast food is obtained in the restaurant setting. In the United States, there are about 50,000 fast food chains, with McDonalds being the largest restaurant chain¹. According to the data brief released in 2013 by the National Center for Health Statistics, adults today consume 11.3% of their daily calories from fast food, which is slightly less than the 12.8% consumed in 2006. They found that proportion of calories consumed by fast food increased with weight⁴. Nearly two-thirds of U.S. adults aged 20 years and older are either overweight or obese.

Several factors common to most fast food items can promote a positive energy balance and increase risk for obesity and diabetes. These factors include excessive portion size, high glycemic load, high energy density, and palatability, emphasizing taste preferences for sugar, salt, and fat⁴. Clinical studies report that consumers of fast foods generally have fewer intakes of fruits, vegetables, milk, and certain vitamins⁹.

College students often have little time and a lot of stress, which pushes them towards fast foods as a means of getting a pleasurable, quick bite to eat. Students often portray a decline in nutritional priorities and pre-existing poor eating habits may worsen while in

college. In 2010, Kim et. al. studied college student health behavior and beliefs using the Health Belief Model. They reported that most college students did not eat any fruit in any single day and about half of them did not eat any vegetables⁴. A recent study suggests that when compared to adults aged above 30, young adults aged 18-29 consume more fast food, with consumption declining with age³. One important factor in the college cohort is the abundant number of fast food restaurants surrounding most college campuses, including East Carolina University. Basic nutritional knowledge is common to students at East Carolina University who are required to take a health class in order to graduate. Honors students, who are required to take an Honors health class, may be more conscious of negative effects of bad dietary choices, including the harms of fast food to health. This study aims to (a) analyze the association between fast food consumption and CVD risk factors: physical inactivity, stress level, BMI, and family history of CVD and CVD risks and (b) assess Honors student knowledge of American Dietary Association (ADA) nutritional recommendations.

Methods

An 18-question survey was administered between April and June 2013 to East Carolina University Honors College students via the Honors College list serve utilizing Qualtrics Survey Tool. Subject participation was voluntary. The survey was self-administered, internet distributed and with results collated over a 2-month period to allow students adequate time to respond. Utilizing Qualtrics survey tool allowed for direct collation and analysis of data without introducing a separate data entry step, thereby minimizing potential for data entry error. The survey was developed using a selection of previously

published and validated questions from the PROJECT EAT-II Survey for Young Adults⁷. The survey provided self-reported information regarding sex, race, and gender. It also measured frequency of fast food, sweetened beverage, and snack consumption as well as height, weight, exercise frequency, stress levels, course load, and family history of cardiovascular disease. Students were also queried on their on or off campus residence and possession of dining plan. Three nutritional trivia questions were used to assess students' nutritional knowledge. Students were categorized as frequent fast food consumers (FFF): 3 or more times a week, or infrequent fast food consumers (IFF): less than three times a week. Body Mass Index (BMI) was calculated for each participant using the standard formula, weight divided by height squared. Based on BMI, participants were labeled as either underweight, normal weight, overweight, or obese as defined by the Centers for Disease Control and Prevention. The university's Institutional Review Board approved this study for the use of Human Subjects in research. Statistical analyses were performed using Microsoft Excel and Minitab. Chi squared analyses were used to test for significance. A p value of 0.05 was considered statistically significant.

Results

92 responses representing 36.2% of the 2012-2013 Honors College were collected. Twenty-three percent of participants were male, 79.3% White, 13% Asian, 5.4 % Black descent, and 2% other. The students ranged from college freshmen to seniors. Fifty-six percent of the participants were FFF (n=52). The average BMI's of the two groups was not significantly different, with the FFF being 22.8 kg/m² and IFF was 23.39 kg/m². More FFF lived off campus (59%) compared to on campus (55%). Overall thirty-seven percent

of honors students were able to correctly identify the nutritional recommendations for young adults. Sweetened beverages were more frequently (at least 3 times per week) consumed by FFF (83%) compared to IFF (50%). Twenty-one percent of FFF consumed snacks in between meals frequently (at least 4 times a day) versus 5.0% of IFF ($p=.027$). Half of IFF answered 2 out of 3 nutritional questions correctly versus only 30% of FFF ($p=.061$). A fifth (21.7%) of participants had at least three CVD risks. Twenty-eight percent of FFF had 3 or more heart disease risks factors versus 12.5% of IFF ($p=.06$). Twenty-seven percent of FFF were physically inactive versus 15% of IFF ($p=.117$). Eighty-eight percent of FFF had elevated stress levels compared to 80% of IFF. Course load did not differ significantly between IFF and FFF. Slightly more than half of the FFF (54%) had heavy course loads (greater than 15 credit hours) compared to 46% in IFF.

Discussion

Adequate nutrition is essential in maintaining a healthy lifestyle. It can decrease existing health problems, prevent future ones, and maintain functional independence, which are all important in prolonging good health and well-being. This study evaluated the impact on cardiovascular health caused by fast food consumption on honors students in a college campus. About half of the honors students were shown to possess at least 2 risks suggesting that risk reduction needs to be considered. Frequent fast food consumers were found to have a greater prevalence of heart disease risk factors compared to IFF. Frequent fast food consumers were 2.3 times more likely to have 3 or more risk factors ($p=0.76$). Individual CVD risk factors including low physical inactivity, high stress level, elevated BMI, and family history of CVD and CVD risks were also observed in higher frequency

compared to the IFF, though it did not reach statistical significance.

A significant difference was observed between FFF and IFF as to how many sweetened beverages were consumed per week ($p=.001$). As expected, FFF consumed sweetened beverages in addition to snacks in between meals at a higher frequency than IFF.

Students who consumed less fast food were significantly more likely to answer nutritional questions correctly, demonstrating that they applied their knowledge to their own eating habits.

Limitations of this study include a relatively small sample size ($n=92$) and the use of convenience sampling of a specific college group. These were due to limits of time and resources. Another limitation of the study was use of self-reported data. Research has proven that underreporting of weight and food intake is common among certain groups (eg overweight vs. lean) ⁵.

Conclusion

This study highlights the importance of nutritional knowledge on healthy eating habits in college students. Students that are better educated on these topics, may be less prone to high fast food consumption and to developing heart disease risks that are caused by unhealthy eating habits. Universities need to focus on improving students' nutritional knowledge. During standard health courses, more time may need to be spent in addressing the importance of healthy diets and nutrition. Students can be made more aware of healthy options at campus dining locations. For example course material could include listing the low-calorie sandwich and soup options at certain dining locations or suggesting coffee shops that offer nonfat milk and light syrup drinks. The importance of

a combination of healthy diet and exercise in preventing heart disease risk should be emphasized in these courses as well. Promoting one healthy lifestyle habit may lead students towards positively changing other habits. For example decreased fast food intake in the honors cohort lead to decreased sweetened beverage consumption resulting in an overall better diet. Universities may also engage on-campus fast food vendors in providing healthier fast food options, offering a selection of non-fast food alternatives and offering more appropriate portion sizes.

Future research should, if possible, aim to expand on these results by engaging in a more detailed longitudinal study of the effects of fast food intake on health. A cost and calorie analysis of fast food consumption can be further applied to this cohort in order to assess the additional economic costs of frequent fast food consumption. By focusing on Honors students as freshmen entering college and following up with them after a certain number of years, significant differences may be seen in diet, BMI, food intake, and nutritional knowledge.

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