Heart Health: lifestyle factors that influence cardiovascular well-being

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Heart Health: lifestyle factors that influence cardiovascular well-being
An Honors Thesis submitted for Honors requirements in the School of Nursing

By
Holly Sawyer

Mentored by Mrs. Marie Graf

ABSTRACT

Each year, one in every four deaths in the United States is a result of heart disease. As the leading cause of death among women and men from various ethnicities, heart disease may be overlooked when making everyday life decisions. As a group of genetic and behavioral conditions, heart disease is the number one killer of Americans. This may be due to the typical Western diet and daily life choices such as drinking alcohol or smoking tobacco. Heart diseases including atherosclerosis and coronary artery disease kill ten times more women than breast cancer (Lewis, et al., 2017). White men have the highest incidence (p. 704) while American Indian or Alaskan native women have the lowest rates of heart disease compared to the nation’s population in 2017 (National Vital Statistics report, Heron, M. 2017). These statistics demonstrate that preventing heart disease needs to be a vital consideration among Americans even at a young age.

The purpose of the present study was to compare relevant factors that influence heart health in undergraduate students at a rural university system within the southeastern United States. Results showed that many students fall short in healthy eating and exercise patterns. In turn, popular lifestyle habits may contribute to the development of heart disease.

Key words: cardiovascular, heart, health, activity, lifestyle, behaviors
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Hypothesis

Although the overarching hypothesis is that students drink too much alcohol and do not eat a well-balanced diet, further hypotheses are outlined below. The survey addressed subjects including demographics, diet, physical activity, habits of consumption, social choices, and knowledge of dietary factors. It was hypothesized that the mean age of participants would range from 18-20; female gender would be more likely, and ethnicity would be mostly Caucasian or Asian. Class ranking of freshman-sophomore was the hypothesized majority, with students taking 12-14 credit hours. For environmental & social factors, it was postulated that participants drank alcohol multiple nights a week with an average of 3-4 drinks per night. Use of tobacco was thought to be prevalent, with users vaping or smoking daily 5-7 times.

For sleep, it was hypothesized that participants get either 5-7 hours or 10 hours, one end being slightly too little with the other slightly above the recommended amount.

Exercise was thought to be performed 4-5 days a week for 30 min - 1 hour. Women may have more cardio exercise focus while men perform more weightlifting.

For nutritional habits, it is presumed that students consume fast food 4 days or 4 meals. Fruits and vegetables may be consumed 1-2 servings per day each. There is a likely chance that many people add salt to their food and report using their electronic devices 3-5 hours a day.

Medications taken & medical conditions listed were not hypothesized. In 2 separate free response questions, students were asked if they took any medications and requested to list them, and if the same for medical conditions.

Methods

To gather information and create the survey, past studies including the “Healthy Lifestyle and Personal Control Questionnaire” developed by Darviri, Alexopoulos, Artemiadis, et al. (2014) were reviewed to gather qualitative data on a person’s routine and dietary habits
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including healthy choices and harm avoidance. Schenkman, Martin, and Butler administered a survey to high school students in Georgia to measure their knowledge of factors that influence heart health as well as their daily choices in diet, activity, and social habits (2006). Using these studies for guidance, the lifestyle survey was drafted for the undergraduate students.

By taking the survey, all subjects agree to allow the principal investigator to use personal answers albeit without any identifiable information. By omitting identifiable information, data is protected, and surveys are anonymous. Serving sizes for fruits and vegetables were provided by eatforhealth.gov.au (2015). Alcoholic beverage serving sizes were referenced from the National Institute on Alcohol Abuse and Alcoholism.

Data Analysis

Demographics

Participants’ ages included: 18: 30, 19: 20, 20: 16, 21: 17, 22: 7, 23. Largest class group of people ranked as freshmen. The smallest amount were juniors. 33 people identified as male and 129 reported female. For ethnicity, there were 102 Caucasian, 14 Hispanic or Latino, 36 African American, 3 Native American, 1 Asian, 6 others, 2 prefer not to say. White ethnicity was the largest group at 62.6% (102 people) and Asians were the smallest group at 0.4%, or 1 person. Most participants were taking a class load of 12-15 hours (76.22%)

One question asking about medical conditions was an open response. Some examples listed asthma, anxiety, depression, allergies, anemia, migraines, or none. Medications taken included birth control, Adderall, loratadine, Zyrtec, citalopram, escitalopram, montelukast, albuterol, or multivitamin.

Dietary Choices

Students were provided with a description of portion sizes for different food groups using the analogy of a hand (handful, first, pal, or thumb-size) or examples in ounces or cup portions. For dietary data, 72.85% of students reported eating 1-2 servings of vegetables per day.
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10.6% listed 3-4 and 1.99% said 5 or more. For servings of fruits 66.23% said 1-2, 11.92% ate 3-4 and 0.66% (1) got in the recommended 5 servings. Similar trends were shown in responses for whole grains. 57.8% of responses stated eating an average of 1-2 poultry foods per day, and 33% ate 3-4. A significantly smaller amount stated 5+ portions per day (4.6%). 53.6% of participants eat 1-2 (3 oz) servings of red meat.

Meals & snacks eaten were reported an average of 2-3 per day from a similar number of people at 56.9%. Students were asked how often they eat fast food; 1.41% said never, 16.2% rarely, 40.85% sometimes/few days per month, 39.44% said multiple days per week, 2.11% said every day. 0% prefer not to say.

Students reported drinking soda or sugary juice never 15.5%, sometimes 24.65%, multiple days a week 19.01%, most days 8.45%, always/daily 5.63%, rarely 26.76%. When asked how many in a day, 26% stated they do not drink them, 50% drink 1, 20.4% drink 2-3, 2.8% have 4-5, more than 5 0.7% or 1 person.

Additionally, 7.75% of students reported never adding salt to their foods, 24.65% said rarely, 28.87% do sometimes, 16.2% do about half the time, 17.61% add salt most of the time, and 4.93% always add salt to their food.

Physical

When asked how many hours of sleep per night students get, 2.13% or 3 people reported getting less than 4, 39% or 55 people get 5-6 hours, 52.48% or 74% of 141 people reported getting 7-8, those who get 9-10 were 5.67% or 8 people, and for 11 or more hours 0.7% or 1 person.

Students were asked whether they perform physical activity. 84% said yes, 14.7% said no, and 0.7% answered prefer not to say. Students were also questioned on the amount of physical activity in minutes per day. 40% said 20-40 min/day. 20% get 50-70, 26.9% perform 20 min or less. 3.5% get 120-150/day.
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Exactly 25% report getting 30 minutes or more of activity 5 or more days per week. 35% said 1-2, and 6.9% said 0 days per week.

Aerobic Activity

Students who reported getting 20 minutes or less of aerobic activity per week were more than half at 54.48% of respondents.

Weightlifting

There were 65% of students who reported 0 days of weightlifting, 17.93% say 1-2 days, 11.72% hit the recommendation of 3-4 days per week. 4.83% said 5 or more. For time spent strength training, 71% said their sessions are 20 minutes or less. There was no option for 0 minutes. 20.69% said sessions were 30-50 minutes, and 8.28% percent said 50 minutes or longer.

Students were asked how many days they performed flexibility or Range of Motion exercises in week- 44.14% reported 0 days, 35.17% had 1-2 days, 15.17% said 3-4, and 5.52% said 5 or more. Students were also asked if they ever experience chest pain at rest. 54.23% said never, rarely do 30.28%, sometimes 14.79% of students have it, and often does 0.7%. For chest pain while exercising, those who answered never were 54.23%, rarely 23.94%, sometimes 18.31%, often 3.52%.

Weight Management

Most participants (48.3% or 71 participants) reported a desire to lose weight. Less students reported maintenance of state (28.5% or 43 people) and 13.2% or 20 people wanted to gain weight. 29.8% answered yes for being interested in information to improve health.

Decision making

Students were asked how often they think of health when deciding what to eat. Those who answered never were 5.63%; 26.06% said sometimes; 23.24% answered about half; those
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who said most of the time were 31.69%; those who report always considering health when
deciding what to eat were 13.38% of respondents.

Caffeine

Students were asked how many cups of coffee (8 oz) a day. 61.27% said none, 35.21%
answered 1-2, 3.52% drink 3-4, and no student had 5 or more. For energy drinks in a day,
93.53% said 0, 6.47% said 1-2, none said more than 1-2.

Nicotine

Nicotine use is reportedly never used by 82.27% of participants, multiple in a week by
6.38%, once a day by 1.42%, 2-4 times a day by 2.84% of people, frequently/5 or more times a
day in 7.1% or 10 people. 78.7% report never experiencing exposure to secondhand smoke,
multiple times in a week, 16.3% have it, 2.13% are around it daily, 0.7% or one person are
around it 2-4 times a day, 2.13% are exposed 5 or more times in a day.

Alcohol

Students were asked how often they drink alcohol. 51.06% never use it, 36.17%
sometimes or 1-2 days a week, 11.35% half the time/2-4 days a week, 1.42% (2 people) most of
the time, and always/daily was none at 0%. Students were provided with serving sizes for
references and asked how much they typically drink. 42.55% report drinking 1-2 drinks, 16.31%
drink 3-4, 5.67% have 5 or more, and those who prefer not to say were 35.46%.

Recreational drug use

Substances not prescribed were surveyed as well. Those always using them were 0%,
most 0%, half the time numbered 1.42%, sometimes were 3.55%, and never using were 92.2% or
130 people. Those who rarely use unprescribed substances were 2.84% or 4 people.

Screen time

Those who reported spending less than 1 hour were 6.38%, 1-2 hr. 12.77%, 2-3 hr.
20.57%, 3-4 18.44%, 4-5 hr. 14.89%, and 5 or more 26.95%.
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Dietary Knowledge

For the recommended daily percentage of calories from fat, 52.17% chose 20-40%. 19.57% said 40-60%, and 36% said less than 20. For servings of calcium, 30.88% answered 1, 44.85% chose 2, and 21.32% said 3.

When asked which food to limit for decreasing blood cholesterol, 12.41% (17 people) chose fish, 38.69% (53 people) said salty food, 11.68% or 16 people chose sugary foods, 29.2% or 40 people answered red meat, 8% or 11 participants said bread and cereal.

Which affects blood cholesterol most. 5.84% said total fat, those who chose saturated fat were 37.23%, participants who answered cholesterol were 15.33%, those for sodium were 40.88%, and those for protein were 0.73%.

Discussion

Dietary

Respondents that reported eating 1-2 servings of fruits and vegetables per day were 72.85%. The ADA recommends at least 5 servings of fruits and vegetables per day. Therefore, the amount reported would be inadequate for sustaining cardiovascular health and may lead to issues of heart disease. Although this reported amount may be accurate, there is a possibility of exaggeration due to implicit bias of the survey.

Those who report never drinking them were 15.5%. Those for sometimes were 24.65%; multiple days a week 19.01%; most days 8.45%, and always/daily were 5.63% of respondents. When asked how many in a day, 26% stated they do not drink them, 50% drink 1, 20.4% drink 2-3, 2.8% have 4-5, more than 5 0.7% or 1 person. The amount of soda and/or sugary beverages consumed by this population is concerning. Sugar-laden beverages are responsible for adding a large amount of sugar and calories to the diet. The American Heart Association suggests limiting added sugar to 9 teaspoons (36 grams) per day for most men and 6 teaspoons (25 grams) per day for most women and children over 2. The average adult gets about 17 teaspoons...
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Of sugar each day -- almost double the limit for men and triple the limit for women. According to Juneau (2018) the excess consumption of sugar can lead to conditions including obesity or diabetes mellitus. Both illnesses contribute to heart disease.

Sodium plays a large role in influencing blood pressure. 17.61% of respondents reported adding salt to their food most of the time, and 4.93% always add salt to their food. Table salt increases water retention which puts pressure on the flow of blood. Too much water in the blood volume can lead to hypertension or high blood pressure. The American Heart Association recommends no more than 2,300 milligrams of sodium in a day and an ideal limit of no more than 1,500 mg per day for most adults, especially for those with high blood pressure (2020).

Another accepted social practice is the fast-food trend: the indulgence of eating foods laden with simple carbohydrates and oily fats from popular chains such as McDonald’s or Cookout. First, the food is affordable to the average college student, tastes good, and can be obtained quickly and conveniently. Any of these factors combined with a sedentary lifestyle can lead to decreased quality of life from choices rooted in easy access with immediate gratification, financially affordable, and appealing thanks to a surplus of fat, salt, or sugar.

Similar amounts of subjects chose the correct answers regarding fats, cholesterol, and calcium. A qualitative observation is that individuals are taught math, but not how to balance a checkbook. In a similar fashion, many Americans choose food without thought of what certain nutrients foods contain or why they may be beneficial or harmful. Education in the area of dietary knowledge is key to making informed decisions for a healthy diet. For recommended calories from fat, 52.17% chose 20–40% correctly.

Dietary Recommendations

Juneau, M. (2018) describes a healthy diet as one that includes 5 servings of vegetables a day (p. 56). Whole fruits and veggies are unbeatable for health. Whole grains should also account for a large portion of the diet because they provide fiber, fullness, vitamins B and E,
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minerals and fats. Juneau recommends 3 servings of grains per day for optimal cardiovascular health. Smaller, more frequent meals - rather than large, heavy meals - can aid digestion and prevent feelings of bloat or indigestion.

The 2015-2020 Dietary Guidelines for Americans place emphasis on cutting back added sugars. Many soft drinks, sweets, and fast foods contain large amounts of refined sugars that add a bulk of calories with little, if any, nutritional value (2016). According to the eighth edition of the dietary guidelines, added sugars should not exceed 10% of daily calories. Ways to reduce these empty calories include making healthy swaps, reading labels, and checking ingredients.

Many processed foods also contain a significant amount of sodium for taste. Because water follows sodium, consuming a large amount of salt will increase blood volume, thus making the heart work harder. This also raises blood pressure and increases the work of the heart. If this trend continues in the diet, a person may develop high blood pressure (>129 systolic / >89 diastolic). Therefore, reducing salt in the diet will have a positive impact on blood pressure by lowering systemic resistance. The Food & Drug Administration recommends consuming no more than 2300 mg of sodium for average people (FDA, 2020). Reducing fat intake to 20-40% of daily caloric intake will reduce the chance of plaque formation which in turn decreases the risk of atherosclerosis.

To achieve and maintain healthy body weight (BMI 18.5-24.9 kg/m^2) calories should be consumed in amounts appropriate to weight management goals. To maintain weight, calories should be eaten for however many are burned. A caloric deficit is needed for weight loss while a surplus is needed to gain weight. For any weight management goals, preparing food at home, tracking calories & reviewing nutrient profiles of food will have a beneficial outcome by increasing knowledge and awareness of one’s diet. Nutrition labels on packaged goods provide all necessary information for making an informed decision about the desired food.

Facts for Dietary Guidance
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Fats should be 25-35% of daily caloric intake. This percentage can be adjusted based on the individual’s desired macronutrient ratio. Cholesterol intake should be no more than 200 mg per day. Sources of cholesterol include saturated fats like fried foods. It is recommended by the American Heart Association that’s fiber intake is 10-25 grams per day (AHA, 2020). Fiber helps create bulk to ease digestion. It also helps maintain satiety, or a feeling of fullness, longer.

PHYSICAL

According to the Sleep Foundation, 7-9 hours of sleep is considered adequate for adults (2021). 2.13% of participants in the study, or 3 people, reported getting less than 4, 39% or 55 people get 5-6 hours, 52.48% or 74% of 141 people reported getting 7-8, those who get 9-10 were 5.67% or 8 people, and for 11 or more hours 0.7% or 1 person. Data presented on the Sleep Foundations website also show that a diet containing lots of sugar or carbohydrates can interfere with sleep. Lastly, it is recommended that people avoid screens for one or more hours before sleep to get a good night’s rest and improve sleep quality.

The variation in the amount of physical activity performed demonstrates a wide range of lifestyles. Some people make time for exercise while others do not currently. Some people that participate in more than 60 minutes per day might be athletes or enjoy exercising and have time to for that long. ¼ of the population get the minimum amount of activity recommended by the AHA per week. The answers concerning the amount of aerobic activity are inconsistent with the previous answer. Perhaps the activity they consider active is not vigorous enough for members of the study to consider it aerobic exercise. However, moderate exercise includes activities such as walking or gardening.

Over half of the sample reported 0 days of weightlifting, leading to the possibility that many participants (mostly women) may not perform weightlifting at all. This affected the question of how long strength training sessions were, since the lowest option was 20 minutes or less. The AHA recommends 2-3 days of strength training activity per week (2020) for 30 minutes or more.
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Many students expressed interest in losing weight. Nearly a third of the participants answered that they would be interested in receiving information about improving their health. Given the chance, providing information for health enhancement could be beneficial to this population.

Exercise & physical well being

Individuals should monitor blood pressure and blood glucose regularly. The AHA also recommends people to partake in at least 150 minutes of aerobic activity per week. This can be broken into 30 minutes most days, at least 5 days a week, or other proportions.

It is possible to exercise excessively. The body needs periods of recovery which often take place during sleep. Not getting enough sleep can negatively impact the healing mechanisms of the body.

DECISION MAKING

The variety of answers showed a range of choices when asked how often subjects consider health when deciding what to eat. If more people considered their health over hunger, numerous lifestyle-inflicted conditions could be prevented.

CAFFIENE

Many students reported drinking 0 cups of coffee or energy drinks in a day. One possibility is that students may not drink caffeine every day, but only occasionally. However, the latter option was not included in this survey.

NICOTINE

Though many students reported never using nicotine, social observation leads me to believe otherwise. As a student on this campus, I can confidently say vapes and electronic cigarettes are much more common than they were just 2-3 years prior. Smoking tobacco & cigarettes have been around for a long time and are still an accepted social practice. According to
HEART HEALTH

Juneau, people who smoke 5 or less cigarettes a day increase their risk of a heart attack (2018). A woman that smokes 20 cigarettes (1 pack) increases her chance of suffering a heart attack by 300%, while a man’s chance increases by 600% (115-116). Smoking causes numerous cancers and conditions including bladder cancer, aortic aneurysms, and chronic obstructive pulmonary disease (CDC, 2020).

Even exposure to secondhand smoke has detrimental effects on the body, especially for children who are in their vital stages of development. Risks of being around secondhand smoke include coronary disease, lung cancer, or sudden infant death syndrome.

ALCOHOL

A large number put “prefer not to say” how much alcohol they consume, showing the lack of trust in anonymity. They may have been being honest, but no answer is an answer.

Alcohol is a popular pastime among my age group. It was an every weekend affair before coronavirus brought things to a halt. Dietary Guidelines for Americans defines moderate drinking as up to 1 drink per day for women and up to 2 drinks per day for men. Heavy drinking (4 or more drinks in a day) has an immediate effect on heart muscle, causing weakening and possible fibrillation. Drinking more than the recommended allowance may have long term consequences that are possibly dose dependent (Piano, 2017). Another study showed that beer may be beneficial in moderate amounts, but excess could harm the body as a whole (Spaggiari, et al. 2020).

RECREATIONAL DRUG USE

Most students report never using drugs not prescribed to them, but some said occasionally or half the time. This may also be unrealistic as people are wary of surveys and tend to be distrustful of guaranteed anonymity.

SCREEN TIME

With so much school and interaction online now, it can be hard to break away from the computer screen. This can affect the daily schedules of some students with a heavy workload
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preventing them from engaging in sufficient physical activity. Further, research shows that children, preteens, and teenagers are using massive amounts of media and those with more screen time have been shown to have increased obesity, reduced physical activity, and decreased health.

**Strengths & Limitations**

One strength of this student is the diversity of the sample across the major disciplines within a large-scale university system with over 20,000 students. Data gathered from 129 participants provides a qualitative description of lifestyle behaviors from the perspective of college students.

The limitations of the study included sample size, COVID-19 restrictions, and survey layout. For sample size, only 166 students out of 1000 chose to participate. Because there was no incentive, this may have contributed to the small number of participants. Few people tend to be motivated to take a survey unless an incentive is offered. Due to COVID-19 restrictions, the survey was not able to be promoted to students in person. Given the chance to add more information, categories dealing with mental health could have been added to enhance how an individual’s outlook affects other lifestyle factors as well.

Some options were not covered or were very generalized, such as the use of recreational drugs or health conditions affecting life. The latter question was open ended to leave room for any possible answers. Another limitation to this study is that answers may not accurately reflect true lifestyle patterns. Either from embarrassment or purposely to skew data, some answers chosen seemed sporadic and unrealistic. Unfortunately, unintentional bias may have been inflicted by wording of questions or answer choices. For example, students did not have the option of recording coffee drinking occasionally or a few days a week as they did for alcohol.
Recommendations

Future Studies

In future research, further questions should be added to address more areas of physical and mental health. Such areas would include perceived stress levels and illicit drug use.

Conclusion

The sample showed that college students in Statesboro, Georgia engage in lifestyle habits that may negatively affect their heart health too frequently. Many students do not eat enough fruits or vegetables. A portion do not get enough sleep, but 75% do. The amount of exercise performed is unclear, but many are not performing sufficient aerobic exercise.

Cardiovascular health is vital to the wellbeing of all people. People who spend a large amount of time drinking alcohol, smoking tobacco, or sitting in excess may be more at risk for “non-communicable diseases.” In other words, their hearts may not be as strong as those who lead actively balanced lifestyles, leaving them vulnerable to lifestyle-influenced conditions such as diabetes or heart disease. These diseases are preventable with knowledge and action.

Nearly half of Americans (47%) have 1 of 3 risk factors for poor heart health: smoking, high blood pressure or high blood cholesterol (CDC, 2019). High blood pressure, known as “hypertension,” is jargon for the “silent killer” because it is often asymptomatic. The only way to know if you have it is to measure. Hyperlipidemia occurs when fat in the blood accumulates. When the fat adheres to blood vessel walls, it can build up into a plaque and harden over time, leading to atherosclerosis. Risk factors for coronary artery disease (CAD) include hypertension, high lipids, sedentary states or physical inactivity, psychological state (stress), obesity, tobacco and alcohol use (Lewis, p. 708). Large corporations in the United States have promoted food markets and consumers to focus their tastes on a large amount of sugar and sodium rich
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products. The prevalence of these lifestyle habits has become prevalent across every age and cultural group.

Preventing cardiovascular diseases is so important because these non-communicable diseases are easier to prevent than treat down the line. Generations to come will find that “chronic diseases are one of the biggest challenges of the twenty-first century.” (Juneau, 2018). Making changes toward sustainable living will not happen overnight, but awareness of these issues is increasing. Improving health begins with knowing the proper ingredients for a healthy lifestyle. The more people that know about heart health, the more lives that can be saved.
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https://www.niaaa.nih.gov/what-standard-drink


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Appendix A

Sent to the following classes during the Fall 2020. Due to restrictions of the pandemic, the principal investigator was unable to visit these classes in person.

Sent to professors:

PR publications- hhiggs@georgiasouthern.edu
Human Anatomy & Physiology- Dr. Matthew Syno
Fitness walking- James Spencer
Marketing recreation services- jbigley@georgiasouthern.edu
Elementary social studies method-
First Year Experience- Dr. Steven Engel
American Government- Barry Balleck
Biology-
Evolution & Ecology- Anna Tansik
Intro to Cinema Studies- Hashiguchi, Matthew
Principles of Accounting I- Stewart, Errol
Principles of Macro Economics- Saenz-Ayala, Mariana
Intro to Business- Robin Wilson
Principles of Chemistry- Brian Koehler
Intro to Sociology- Nancy Malcom
first year seminar- kherman@georgiasouthern.edu

This is the email to professors to distribute the survey:
Hello,

I am a senior nursing student at GSU Statesboro. For my honors capstone project, I am conducting a research survey to study lifestyle behaviors of undergraduate students that influence their heart health. I have created this short survey to gather a range of information about behavioral habits. To make my survey as diverse as possible, I would like to distribute this to a variety of students at Georgia Southern.

I would be very appreciative if you could post this survey link on folio for students to take at their leisure. It should only take 10 minutes to complete. I have no incentives to offer them, but if you could encourage your students to complete this survey, I would be forever grateful to you!

Survey link:

Peace, blessings & hail Southern.
Holly Kathryn, SN GSU
Appendix B- questionnaire

This survey will examine behaviors and choices that influence your cardiovascular wellbeing, or the health of your heart.

This survey is anonymous, and information is not distributed to anyone outside of this study. By taking the survey, all subjects agree to allow me, the principal investigator, to use answers without any identifiable information. By omitting identifiable information, data is protected, and surveys are anonymous.

Completion of the survey indicates your willingness to participate in this research.

Data will be used in group statistics to analyze information and gain perspective on the manners of the undergraduate population at Georgia Southern University. Hail Southern.

Informed Consent
Heart Health: lifestyle factors that influence cardiovascular well-being

Holly Sawyer, senior Nursing student at Georgia Southern University and principal investigator of this study. I am conducting this research for my Honor’s Capstone Project because I am curious about the behaviors my fellow GSU students participate in that influence the well-being of their cardiovascular physiology.

Purpose of the Study: The purpose of this research is to compare relevant factors that influence heart health in undergraduate students

Procedures to be followed: Participation in this research will include completion of one survey including 51 questions that cover subjects including demographics, diet, physical activity, habits of consumption, social choices, and knowledge of dietary factors.

Discomforts and Risks: possible embarrassment or dealing with sensitive issues. Answering these questions may lead to a reflection of daily choices that will result in continued choices or a change in daily habits. Very little possibility of injury exists from taking the survey, physical or psychological. I understand that medical care is available in the event of injury resulting from research but that neither financial compensation nor free medical treatment is provided.” Referral information for those who wish to seek assistance:
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Counseling Center: Forest Drive PO Box 8011 Statesboro, GA 30460 • 912-478-5541
Health Services: • P.O. Box 8043 • 912-478-5641

Benefits:

a. The benefits to you as a participant include a reflection of daily choices and access to information that can help you improve your overall health.

b. The benefits to society include a measure of the daily choices and lifestyles undergraduate students at Georgia Southern partake in. The sample of students is relatively small but diverse.

Duration/Time required: the survey takes approximately 10 minutes or less to complete.

Statement of Confidentiality: I, the principal investigator, and my advisor will be the only persons to have access to the information provided by participants. It will be maintained in Qualtrics and possibly used for future use. Data will be maintained in a secure location for a minimum of 3 years following completion of the study with Mrs. Marie Graf.

Future use of data: Deidentified or coded data from this study may be placed in a publicly available repository for study validation and further research. You will not be identified by name in the data set or any reports using information obtained from this study, and your confidentiality as a participant in this study will remain secure. Subsequent uses of records and data will be subject to standard data use policies which protect the anonymity of individuals and institutions. Data be discarded after 3 years. Until then, it will be maintained for future use in de-identified fashion for future use in analysis in a secure location.

Right to Ask Questions: You have the right to ask questions and have those questions answered. If you have questions about this study, please contact the researcher named above or the researcher’s faculty advisor, whose contact information is located at the end of the informed consent. For questions concerning your rights as a research participant, contact Georgia Southern University Institutional Review Board at 912-478-5465.

Compensation: There are no stipends, credits, or other incentives to participation.

Voluntary Participation: You do not have to participate in this research; they may end their participation at any time by telling the person in charge, not returning the instrument or other options; you do not have to answer any questions you do not want to answer. However, if you do choose not to answer one of the questions, you will not complete the survey and your responses will not be counted.
Penalty: There is no penalty for deciding not to participate in the study; You may decide at any time you don’t want to participate further and may withdraw without penalty or retribution.

Agreeing to be in this research study means you are giving us permission to collect and process your sensitive personal data while you are in Europe, as well as transfer your data, back to the United States, which has not received an adequacy decision under the GDPR. Giving consent here includes the collection and transfer of your personal data, including sensitive personal data, while in the EEA during this study.

All information will be treated confidentially. There is one exception to confidentiality that we need to make you aware of. In certain research studies, it is our ethical responsibility to report situations of child or elder abuse, child or elder neglect, or any life-threatening situation to appropriate authorities. However, we are not seeking this type of information in our study nor will you be asked questions about these issues.

You must be 18 years of age or older to consent to participate in this research study. Completion of the survey indicates your willingness to participate in this research.

Principal Investigator: Holly Sawyer, campus address: PO Box 8158 - 521 C.O.E. Drive | Statesboro, GA 30460, telephone: 912-515-5683, email: hs02645@georgiasouthern.edu

Other Investigator(s): none

Research Advisor: Marie Graf, campus address: PO Box 8158 - 521 C.O.E. Drive | Statesboro, GA 30460, campus telephone: 912-678-5966, email: annennis@georgiasouthern.edu

The following questions ask questions related demographic characteristics.

What is your age?

What is your gender?

- Male
- Female
- Prefer not to say

What is your ethnicity?
HEART HEALTH

- White
- Hispanic or Latino
- Black or African American
- Native American or American Indian
- Asian / Pacific Islander
- Other
- Prefer not to say

**What is your class ranking?**

- Freshman
- Sophomore
- Junior
- Senior
- Other

**How many credit hours are you taking this semester?**

- 6 hours or less
- 7-11 hours
- 12-15 hours
- 16 hours or more

**What is your height in feet and inches? Please select one of the following.**

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<tr>
<th>Height in feet and inches</th>
<th>4'11 or shorter</th>
<th>5'0</th>
<th>5'1</th>
<th>5'2</th>
<th>5'3</th>
<th>5'4</th>
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<td>5'9</td>
<td>5'10</td>
<td>5'11</td>
<td>6'0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>or taller</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**What is your weight in pounds? (number value only)**

Please list any known medical conditions you have here. If you do not have any, put none.

Please list your current medications and those from the past 6 months here. Separate different medicines with a comma and space.

If you do not take any medications, put none.

If you would prefer not to answer, please type "prefer not to answer"

Current Progress 0%
These questions will give an idea of your typical diet. Please provide the most accurate answers with an average in accordance with your diet for the last month.

How many servings of vegetables do you eat in a day?

1 serving of cooked vegetables is roughly 1 cup, or the size of a fist. 1 serving of salad mix = 2 cups, or 2 fists.

- 0
- 1-2
- 3-4
- 5 or more

How many servings of fruits do you eat in a day?

1 serving of fruits would be a medium apple = 1 cup (8 ounces) = 1 fist

- 0
- 1-2
- 3-4
- 5 or more

How many servings of whole grains do you eat in a day?

1 serving would be 1 slice of whole wheat bread. A bowl of noodles, rice or oatmeal would be 1/2 cup per serving, or a handful.

- 0
- 1-2
- 3-4
- 5 or more

How many servings of poultry (chicken, turkey, etc.) do you eat in a day?

1 serving would be 3 ounces, or the size of your palm.

- 0
- 1-2
- 3-4
### HEART HEALTH

**How many servings of red meat (beef or pork) do you eat in a day?**

1 serving would be 3 ounces, or the size of your palm.

- 0
- 1-2
- 3-4
- 5 or more

**How many meals and snacks do you usually eat in a day in the last 30 days?**

- 0-1
- 2-3
- 4-5
- 6 or more

**What are your weight management goals, if any?**

- Weight loss
- Weight gain
- Weight maintenance
- None
- Prefer not to say

**Would you be interested in receiving information that could help you reach your goals or improve your health?**

- Definitely yes
- Probably yes
- Might or might not
- Probably not
- Definitely not
HEART HEALTH

The following questions ask about levels of physical activity. These questions help gather information on the activities to influence your heart health.

Do you participate in physical activity? This includes walking, sports, dance, etc.

- Yes
- No
- Prefer not to say

If yes, how many minutes of physical activity do you get per day?

- 20 minutes or less
- 20-40 minutes
- 50-70 minutes
- 80-120 minutes
- 120-150 minutes

How many days a week do you perform moderate activity (walking, biking, gardening) for at least 30 minutes?

- 0 days
- 1-2 days
- 3-4 days
- 5 or more days

How many minutes of aerobic activity do you get per week?

- 20 minutes or less
- 20-40 minutes
- 50-70 minutes
- 70-100 minutes
- more than 100 minutes

How many days a week do you lift weights or perform resistance exercises?

- 0 days
- 1-2 days
- 3-4 days
- 5 days or more

How long are your strength training sessions?

- 20 minutes or less
- 30-50 minutes
HEART HEALTH

- 50 minutes or longer

**How often do you perform flexibility or range of motion exercises in a week?**
- 0 days
- 1-2 days
- 3-4 days
- 5 days or more

**How often do you have chest pain at rest?**
- Often
- Sometimes
- Rarely
- Never

**How often do you have chest pain while exercising?**
- Often
- Sometimes
- Rarely
- Never

Current Progress 39%

These questions help determine the amounts of caffeine, salt, or refined sugars you consume.

**How often do you think about your health when deciding what to eat?**
- Always
- Most of the time
- About half the time
- Sometimes
- Never

**How many cups of coffee do you drink in one day?**
- 0
- 1-2
- 3-4
- 5 or more
- Prefer not to say

**How many energy drinks (Red Bull, Bang, Monster, etc) do you drink in one day?**
**HEART HEALTH**

- 0
- 1-2
- 3-4
- 5 or more
- Prefer not to say

**How often do you eat fast food (burgers, hot dogs, french fries or hashbrowns)?**
- Never
- Rarely
- Sometimes - a few days a month
- Multiple days a week
- Everyday
- Prefer not to say

**How often do you drink soda or sugary juices?**
- Never
- Rarely
- Sometimes
- About half the time (multiple days a week)
- Most of the time (most days)
- Always (daily)

**If you drink soda or sugary beverages, how many do you have?**
- Do not drink them
- 1
- 2-3
- 4-5
- more than 5

**How often do you add salt, hot sauce, or soy sauce to your food?**
- Never
- Rarely
- Sometimes
- About half the time
- Most of the time
- Always
HEART HEALTH

These questions ask about habits that have to do with social life. Please be honest.

How many hours of sleep do you get in a night in the last 30 days?

- less than 4 hours
- 5-6 hours
- 7-8 hours
- 9-10 hours
- 11 or more hours

How often do you use nicotine products (cigarettes, vaping, tobacco)?

- never
- multiple times a week
- once a day
- 2-4 times a day
- frequently- 5 or more times a day (every hit counts)

How often are you exposed to second hand smoke?

- never
- multiple times a week
- daily
- 2-4 times a day
- 5 or more times a day

How often do you drink alcohol?

- Never
- Sometimes- rarely, 1-2 days/week
- About half the time- 2-4days/week
- Most of the time- 5+ days
- Always, daily

When you drink alcohol, how many drinks do you have?

1 drink is equivalent to 12 ounces of beer (1 can) 5 ounces of wine (1/2 glass) or 1.5 ounces shot of distilled spirits (1 shot of whiskey or vodka)

- 1-2
- 3-4
- 5 or more
- Prefer not to say
HEART HEALTH

How often do you use substances not prescribed to you? This may include stimulants such as adderall, cocaine or depressants like percocets, hydrocodone. Remember that the survey is anonymous and your answers cannot be traced back to you.

- Always
- Most of the time
- About half the time
- Sometimes
- Rarely
- Never

How many hours do you spend on the computer, watching television, playing video games per day?

- less than 1 hour
- 1-2 hours
- 2-3 hours
- 3-4 hours
- 4-5 hours
- 5 or more hours

These questions will examine your knowledge of dietary guidelines.

What percentage of one’s daily total calories should come from fat? (Choose which range this percentage would fall into)

- 0-<20%
- 20-40%
- 40-60%
- 60-80%
- 80-100%

How many servings of calcium products should you eat on a daily basis? (1 serving = 8 oz of dairy milk)

- 1
- 2
- 3
- 4
- 5

Which of the following is not a risk factor linked to the development of heart disease?
HEART HEALTH

- High blood pressure
- High cholesterol
- Diabetes
- Arthritis
- Obesity

To help decrease your blood cholesterol, which of the following foods should you limit in your daily diet?

- Fish
- Salty foods (chips, pretzels)
- Sugary foods (candy, cookies)
- Red meat
- Breads and cereals

Which of these nutrients, when eaten in excessive amounts, affects blood cholesterol the most?

- Total fat
- Saturated fat
- Cholesterol
- Sodium
- Protein

Thank you for your participation in this survey. You are appreciated!
### Gender / Ethnicity

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### Age / Ethnicity

| Ethnicity          | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 |
|--------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| White              | 15 | 5  | 3  | 5  | 7  | 4  | 3  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| Hispanic or Latino | 14 | 0  | 0  | 5  | 1  | 2  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| Black or African American | 16 | 0  | 0  | 17 | 4  | 2  | 6  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| Native American or American Indian | 3  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| Asian / Pacific Islander | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| Other               | 0  | 0  | 0  | 3  | 1  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| Prefer not to say   | 2  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |

### Age/Gender

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### Gender/Veggie servings

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HEART HEALTH

Medical Conditions word cloud (darker word = higher count)

Meds

| Q13: How many servings of vegetables do you eat in a day? 1 serving of cooked vegetables is roughly 1 cup, or the size of a fist. 1 serving of salad mix = 2 cups, or 2 fists. |
|---|---|---|---|---|---|
| Ethnicity | 0 | 1-2 | 3-4 | 5 or more |
| White | 95 | 14 | 69 | 12 | 0 |
| Hispanic or Latino | 13 | 1 | 11 | 0 | 1 |
| Black or African American | 34 | 5 | 23 | 4 | 2 |
| Native American or American Indian | 2 | 0 | 2 | 0 | 0 |
| Asian / Pacific Islander | 1 | 0 | 1 | 0 | 0 |
| Other | 6 | 2 | 4 | 0 | 0 |
| Prefer not to say | 0 | 0 | 0 | 0 | 0 |

Ethnicity/Veggie Servings

| Q47: Do you participate in physical activity? This includes walking, sports, dance, etc. |
|---|---|---|---|---|
| Ethnicity | Yes | No | Prefer not to say |
| White | 92 | 79 | 12 | 1 |
| Hispanic or Latino | 12 | 9 | 3 | 0 |
| Black or African American | 33 | 27 | 6 | 0 |
| Native American or American Indian | 2 | 2 | 0 | 0 |
| Asian / Pacific Islander | 0 | 0 | 0 | 0 |
| Other | 4 | 4 | 0 | 0 |
| Prefer not to say | 0 | 0 | 0 | 0 |

Ethnicity / Physical Activity
HEART HEALTH

Key words mentioned together in comments will appear closer together.

Conditions K-nearest neighbors

Keywords
Key words mentioned together in comments will appear closer together.

Meds K-nearest neighbors