NEAR EAST UNIVERSITY

INSTITUTE OF GRADUATE STUDIES

DEPARTMENT OF BIOSTATISTICS

Association Between Heart Attack and Risk Factors in USA: A Cross-sectional study

M.Sc. Thesis

Murphy A. Lowell

Nicosia

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M.Sc. THESIS

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June 2023

Approval

We hereby attest that we have been familiarized with the thesis that has been presentedby Murphy A. Lowell titled **"Association between heart attack and risk factors in the USA: A cross-sectional study"** and that, in our collective judgment, it is perfectly appropriate both in terms of its scope and quality, to serve as a thesis for the Master of Biostastitics degree.

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Declaration

I hereby declare that all informations, documents, analysis and results in this thesis have been collected and presented according to the academic rules and ethical guidelines of Institute of Graduate Studies, Near East University. I also declare that as required by these rules and conduct, I have fully cited and referenced information and data that are not original to this study.

Murphy A. Lowell
22/06/2023

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Murphy A. Lowell

Association between heart attack and risk factors in the USA: A cross-sectional study

Murphy A. Lowell

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Abstract

The prevalence of cardiovascular (CV) disease continues to make it one of the major contributors to death rates not just in the country of the United States, but also in every other country throughout the globe. The purpose of this research is to establish whether or not there is a correlation between heart attack and the risk factors that might contribute to one's likelihood of having one in the United States. The following is a list of materials and methods: The design of the study that will be employed is called a cross-sectional design. Interviews were conducted by the Behavioral Risk Factor Surveillance System (BRFSS) using both landlines and mobile devices. The program known as SPSS was utilized in the process of carrying out the statistical analysis. The data will first be reviewed to ensure that they are complete, and then they will be cleaned. For the purpose of describing the variables, We used descriptive statistics such as frequency and mean to describe the data. In order to better understand the personalities of those who responded to the survey, chi-square tests were carried out. The distribution of the data was examined using a histogram.

Within the section of the report that is dedicated to the analysis, a chi-square test is carried out, and a significance level of 0.05 or below is taken into account at all times.In addition, binary logistic regression was carried out, and variables with P-values of 0.1 or below were taken into consideration as potential candidates for multiple logistic analysis. After that, multiple logistic regressions were carried out, and the adjusted odds ratio (AOR) was investigated, along with its 95% confidence interval. It was determined that a variable was statistically significant if its P-value was lower than 0.05 and if it met this threshold.

Result The total number of people who have had a heart attack is 23 893, which is 9.4% of the population. There is a correlation between the respondent's age, level of education, income, smoking status, excessive alcohol intake, high cholesterol level, body mass index, and degree of physical activity, as shown by a p-value that is less than 0.001.

In conclusion, the following suggestions are offered: The total prevalence of heart attacks is one tenth of what it is in the population that was studied.
In addition, variables such as age, level of education, income, smoking status, excessive alcohol consumption, elevated cholesterol level, high body mass index, and not getting enough exercise are all factors that can increase the likelihood of having a heart attack. As a result, it is essential to give the prevention of heart attacks a higher priority in specific areas, such as the provision of health education on the consumption of alcohol, the education for stopping smoking, the provision of health education on the body mass index, and the education for physical activity.

Key Words*:Heart attack, risk factors, USA*

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List of Abbreviations

CDC	Centers for Disease Control
SPSS	Statistical package for the social science
WHO	World Health Orzigation
CDV	Cadiovascular Disease
BMI	Body Mass Index
SCD	Sudden cadiac death
BRFSS	Behavioural Risk Factor Surveillance System
CL	Confidience level
LTPA	Leisure time physical activities
HFrEF	Heart failure with redue ejection fraction
HFpEF	Heart failure with preserved ejection fraction
CAD	Cornary artery disease
PA	Physiacl activities
AOR	Adjusted odd ratio
AMI	Acute Mycardia Infection
AUC	Area Under the Curve
NDIC	National Institute of Cardiavascular Disease
ROC	Reciever Operating Characteristic

CHAPTER I

Introduction

The primary factor in the majority of deaths across the world since 2007, has been cause by heart attack. According to WHO, 2021 and Virani et al. (2020), cardiovascular attack continue rise in the number of fatalities that may be related to cardiovascular diseases. This results in an estimated loss of 17.9 million lives each year. According to Virani et al. (2020) and the Centers for Disease Control and Prevention (CDC), around 750,000 heart attacks and 18835 primary-cause sudden cardiac deaths (SCD) occur in the United States of America yearly. Early intervention is necessary for achieving the goal of lowering morbidity and death rates. Depending on the findings of the Centers for Disease Control and Prevention in the year 2020, It is likely that improved health outcomes and a rise in the proportion of people who survive heart attack might be achieved by the education of the entire population about signs and symptoms of a heart attack. Unhealthy eating habits, a lack of physical activity, smoking cigarettes, and drinking too much alcohol are some of the most important behavioral risk factors for cardiovascular disease and stroke. Negative health outcomes, such as hypertension, rising blood glucose, elevated blood lipids, and excess body fat, are more likely to affect those who engage in hazardous behaviors. Putting an end to one's smoking habit, reducing the amount of salt one consumes, increasing one's consumption of fruits and vegetables, engaging in regular physical activity, and avoiding excessive consumption of alcohol are all proven ways to lower one's risk of developing cardiovascular disease in oneself. (WHO, 2021).

According to the National Health Interview Survey, the age-adjusted prevalence of heart disease was 10.6% in the year 2017; the equivalent age-adjusted prevalence of heart disease among whites, blacks, Hispanics, and Asians was 11.0%, 9.7%, 7.4%, and 6.1%, respectively (Virani et al.,2020). The overall prevalence of cardiovascular disease, taking into account people's ages, was 10.6% throughout the total population. In a recent study that was conducted using the Global Burden of Disease methodology, the burden of cardiovascular disease in the states of the United States was examined. Researchers came to the conclusion that, dietary risks, high systolic blood pressure, a high body mass index, a high total cholesterol level, a high plasma glucose level, smoking, and low levels of PA all contribute significantly to the development of cardiovascular disease.

Studies also foundout that a significant portion of cardiovascular disease is caused by low levels of PA. In addition to high total cholesterol levels, smoking and insufficient physical activity (PA) levels are also risk factors for cardiovascular disease. According to Luan et al. (2021) there is still a delay between the time it takes to become aware of the warning indications of a heart attack or stroke and the time it takes to act quickly. Reducing the amount of salt in one's diet, increasing one's intake of fruits and vegetables, participating in regular physical activity, and refraining from abusing alcohol are all ways to minimize one's risk of developing cardiovascular disease (WHO, 2021).

According to the Centers for Disease Control and Prevention (CDC), in collaboration with the National Institutes of Health and numerous other governmental organizations including the American Heart Association (AHA) compiles in one document the most recent statistics regarding heart disease, stroke, and cardiovascular risk factors in the AHA data published, which includes basic health behaviors (smoking, physical activity [PA], diet, and weight) and health factors (cholesterol, blood pressure [BP].

The Statistical Update is an important resource for members of the general public, decision makers, members of the media, doctors, health service providers, researchers, health activists, and anyone who are looking for the most accurate data that is currently available on the causes and conditions. Cardiovascular disease (CVD) has tremendous health and financial repercussions that are felt not only in the United States but globally as well.Additionally, the most recent data on a number of significant clinical heart and circulatory disease conditions (such as stroke, congenital heart disease, rhythm issues, subclinical atherosclerosis, coronary heart disease, heart failure [HF], valvular heart disease, venous disease, and peripheral artery disease) as well as the outcomes associated with these conditions (such as standard of care, procedures, and financial costs) are included in the Statistical Update. Since 2007, researchers have referenced the annual editions of the Statistical Update more than 20,000 times in their published works of academic study.

Problem Statement

One in every four young people between the ages of 20 and 39 people in the United States receive a diagnosis of cardiovascular disease per year. (Virani et al., 2020; Rizk et al., 2021). Heart disease and other circulatory disorders are currently the main causes of death on a global basis. According to research conducted by Adams et al. (2020), the likelihood that someone will experience a heart attack increased by 0.8% for every one standard deviation (or 4.5 kg/m²) that was added to their body mass index. According to the findings of Van-Hooser et al. (2020), Native Americans with low composite knowledge scores for heart attacks and strokes are more likely to be older, to have lower levels of education, to be unemployed, to be poorer, to lack insurance, to live in rural areas, to be male, to not have a primary care physician, and to not have had a physical examination in the preceding year were at risk for developing CVD. The absence of a main health care provider and a lack of previous experience living in rural locations are two additional risk factors. In the United States of America, cardiovascular disease (CV disease), which is the main cause of death worldwide (Virani, et al., 2020; Rizk, et al., 2021), affects 25 percent of young people between the ages of 20 and 39 (Rizk, et al., 2020). According to study that was carried out in 2020 and 2021 by Virani et al. and Rizk et al. respectively, cardiovascular disease was found to be the main cause of mortality on a global scale.

A person's risk of developing cardiovascular disease can be reduced by doing a variety of things, including reducing the amount of salt in their diet, increasing the amount of fruits and vegetables they consume, engaging in regular physical activity, and avoiding excessive alcohol consumption (WHO, 2021). Participants between the ages of 46 and 64, who were married, Chinese, had higheducationstatus, and those who had access to earlier information all showed remarkable understanding of eight modifiable risk factors for heart attacks. (Ahmed, et al., 2020). Han and C.H. (2019) found that a lack of comprehension of the warning signals of cardiovascular disease (CVD) was substantially associated with a range of risk factors, including smoking, obesity, high blood pressure, and high cholesterol levels. older age, being male, having a lower education level, not exercising regularly, not having a partner, being unemployed, having a poor economic status, having poor health behaviors (high salt diet, no health screenings), having a poor psychological status (high stress, self-perceived poor health status), and having hypertension or dyslipidemia are all factors that increase the likelihood of developing cardiovascular disease.

There was a strong correlation between the impression of a lowered likelihood of having a heart attack and rising age, a lower body mass index, and a larger amount of time spent walking per day (in minutes). It was shown that having no history of heart attack in one's family, a lower body mass index (BMI), as well as a reduced intake of fat, were all very significant indicators of a decreased sense of diabetes risk. This is in accordance with Fukuoka and Oh's (2022) findings. Additionally, persons who are overweight or obese have an increased risk of developing cardiovascular disease as well as having a stroke.In addition to the risk factors that are already associated with these conditions, such as high blood pressure, high levels of LDL cholesterol, low levels of HDL cholesterol, high levels of triglycerides, and type 2 diabetes, being overweight or obese contributes to this increased risk. Furthermore, having high triglycerides and high blood pressure both put you at an increased risk.This is because people who are overweight or obese have a higher total body mass index (BMI) than people who are of healthy weight. Overweight individuals have a larger risk compared to those who maintain a healthy body weight.

Adults, who account for around 74% of the population, make up the vast majority of persons who are either overweight or obese in the United States.
Keeping a healthy weight and eating a diet that is balanced in all of its components can help lower a person's risk of developing cardiovascular disease. A diet that is considered to be healthy focuses an emphasis on consuming fruits and vegetables, whole grains, dairy products that are low in fat, and lean proteins, while also minimizing the amount of added sugars, salt, and saturated and trans fats that are ingested. Even in those who do not have any other risk factors, a sedentary lifestyle may increase the likelihood of developing cardiovascular disease. As a result, the likelihood of other risk factors, such as type 2 diabetes, being overweight, high blood pressure, and high cholesterol, may be increased as a result of this. There is an urgent need for actions in this area because just 24% of adults and 16.5% of high school students satisfy the standards for aerobic and muscle-strengthening exercise. According to the World Health Organization (WHO), a person's life risk factors, such as coronary artery disease (CAD), increase the possibility that they may have heart attack(WHO, 2014).

According to research that was carried out and published by Dokken et al. (2008), diabetes is a factor in the development of cardiovascular disease. Other risk factors for coronary artery disease (CAD) include hyperlipidemia and hypercholesterolemia, hypertension, obesity, smoking, and a family history of CAD, according to the National Institute of Cardiovascular Disease and Stroke (NDIC).All of these risk factors increase

the likelihood of developing coronary artery disease. As a result, the study's goal is to assess the relationship between risk factors for heart attacks and incidences of heart attacks in the United States. Furthermore, to explore the association between heart attacks and the different risk factors that could significantly rise in the United States in the year 2023. The RF track expands upon these shared duties to the extent that they contribute to the attainment of a certain goal, which is the assessment of CAD risk factors and indicators.

Purpose of the study

The purpose of this study is to investigate the relationship between heart attacks and the many risk factors that may cause an increase in the incidence of heart attacks in the United States in the year 2023.In order to determine the rate of heart attacks that are expected to occur in the United States in 2023.The purpose of this study is also to determine, for the year 2023 in the United States, the factors that put people at risk for heart attacks.

Research Questions/ Hypothesis

What is the association between heart attack and risk factors amoung study participants in the USA?

What is the prevalence of heart attack amoung study participants in the USA?

What are the importance of handeling risk factors with care and creating adwareness on avoiding high risk life styles?

What are the leading risk factors for heart attacks in the United States?

Significance of the study

The importance of this inquiry can be tied back to the fact that coronary heart disease is the main cause of death in the United States of America, being responsible for almost one out of every four deaths that occur on an annual basis. This statistic can be connected back to the fact that coronary heart disease is the major cause of death in the United States of America.The investigation of the association between risk factors and the heart can therefore

help in the identification of modifiable risk factors and guide public health policies to reduce the chance of having a heart attack.

By using a cross-sectional approach to the investigation of the issue, we can gain a better understanding of the ways in which distinct risk variables are related with heart attack in a variety of populations. This information can then be put to use to assist in the development of public health programs that will assist individuals who are afflicted with cardiovascular disease in leading healthier lives.

Limitations of the study

This study, like most quantitative research, has limitations. A few of these constraints are as follows:

With the help of the data acquired, the research focuses primarily on the United States and does not provide information on how risk factors for heart attack vary across other countries, cultures, and socioeconomic levels.

Furthermore, because the study was based on the history of patients, it is susceptible to recall bias.

CHAPTER II

Literature Review

Overview of heart attack

According to research conducted by Virani, et al. (2020), the number of deaths that occurred among permanent residents of the United States in 2017 was 2813503, which represents an increase of 69255 over the previous year's total. In 2017, there were 379133 fatalities in the United States that might be attributed to SCD. According to Rizk T, (2021), cardiovascular (CV) sickness continues to affect over half of everyone above the age of 18 in the United States who are over the age of 20, as well as almost a quarter of all young people who are between the ages of 20 and 39. According to Adams et al. (2020), the chance of having a heart attack increased by 0.8% for every one standard deviation or (4.5 kg/m^2) increase in body mass index (OR = 1.008, with 95% confidence intervals of (1.003, 1.012), $P < 0.001$).

Participants with higher educational levels, marital status, Chinese ethnicity, and those who had received earlier information had an excellent grasp of the eight modifiable risk factors for heart attacks. Participants between the ages of 55 and 64, older participants, men, lower education levels, absence of regular exercise, single status, unemployment, poor economic status, poor health behaviors (high salt diet, no health screening), poor psychological status (high stress, self-perceived poor health status), and the presence of hypertension or dyslipidemia were all significantly associated with a poor understanding of the material. The results of a multivariable logistic regression showed that these factors were all significantly associated with heart attack. A greater quantity of daily walking time (in minutes), a lower body mass index (BMI), and a lower perceived risk of having a heart attack were significantly connected with one another. A lower perceived risk of having a heart attack was also associated with a lower body mass index (BMI).It was shown that a lower perceived risk of having a heart attack was substantially linked with each of these characteristics ($P< 0.05$). When an individual's age was higher, their BMI was lower, and the amount of time spent walking each day grew, the perceived risk of having a heart attack also increased. This was especially true when the individual was also more active.

It was demonstrated that a reduced perception of the danger of acquiring diabetes was significantly contributed to by not having a family history of heart attack, having a lower BMI, and consuming less fat. According to Fukuoka, et al (2022). There is a need for further documentation.In order to conduct an analysis of the prevalence of cardiovascular disease (CVD) and the risk factors that are associated with it, studies uses estimates from a variety of sources. In doing so, the GBD of Study 2019 takes into account the underlying causes of cardiovascular mortality.The Global Burden of Disease (GBD) project is an ongoing multinational effort with the objective of producing comparative and consistent estimates of the state of health of populations over the course of time.The Global Burden of Disease Study (GBD) employed all of the population-level data sources that were easily accessible in order to develop estimates for 204 nations and territories spanning the time period from 1990 to 2019. These estimates include a range of years, from 1990 all the way up to 2019. The information contained in these data sources covered a wide range of topics, including incidence, prevalence, case fatality, mortality, and health hazards.

The number of deaths that may be ascribed to cardiovascular disease has been progressively increasing from 12.1 million (95% confidence interval [UI]:11.4 to 12.6 million) in 1990 to 18.6 million (95% confidence interval [UI]: 17.1 to 19.7 million) in 2019; this represents a steady increase from the previous record high of 12.1 million deaths in 1990. Each day and a reportedly reduced likelihood of having a heart attack.This rise can be due to the fact that the global population is aging. There are a variety of causes that could be responsible for this rise in total. The number of people living with prevalent instances of total cardiovascular disease went from 271 million in 1990 to 523 million in 2019 (95 percent uncertainty interval [UI]: 497 to 550 million). This increase occurred during the years 1990 and 2019. This marks an approximately one hundred percent rise from the previous year. The number of people living with impairments climbed from 17.7 million (interquartile range [IQR]: 12.9 to 22.5 million) to 34.4 million (IQR: 24.9 to 43.6 million) throughout this time period. Over the course of the last several decades, the prevalence of cardiovascular disease has been progressively increasing in practically every nation that is not a high-income nation. The current pattern is anticipated to persist. Even more concerning is the fact that the age-adjusted prevalence of cardiovascular disease has begun to increase in some places, despite the fact that it has been decreasing for a considerable amount of time in nations with high incomes.

There is an urgent need to focus on putting into practice policies and interventions that are already in place and that are successful in terms of their cost if the world is to achieve the goals for Sustainable Development Goal 3 and achieve a 30% reduction in premature death attributable to noncommunicable illnesses.

This is a requirement that needs to be met if the world is going to fulfill these goals. It is imperative that immediate attention be paid to putting into action the policies and programs that are already in place if the world is going to be successful in achieving these goals.

Theoretical Framework

The objective of the study is to carry out a cross-sectional analysis with the goal of figuring out the nature of the connection that exists between the risk of having a heart attack and the actual number of heart attacks that occur in the United States. In order to gain a better understanding of this connection, the research concentrates on a variety of hypotheses and models that discuss the origins of heart attacks as well as the factors that put people at risk for having one.The traditional risk factors model is one of the models that is used to explain the high incidence of heart attacks. It is one of the most common models. According to this model, the likelihood of having a heart attack is increased by a number of factors, including but not limited to hypertension, diabetes, smoking, having high cholesterol, and having a history of cardiovascular disease in one's family. This methodology was applied in a significant number of the earlier studies in order to ascertain the connection that exists between the myriad of potential risk variables and the occurrence of heart attacks.

In addition, the social determinants of health model proposes that the result of an attack, such as a heart attack, is influenced by social and economic factors such as education level, income level, and race. According to this theory, a population that is disadvantaged has a higher risk of having a heart attack as a result of a lack of access to resources for healthcare, as well as good food, a safe environment, and other basic necessities.

In addition, the health behavior model proposes that individual habits, such as one's diet, level of physical activity, and adherence to prescription regimens, can have an effect on one's risk of suffering a heart attack.

According to this theory, individuals who engage in healthy activities such as frequent exercise and a diet that is well-balanced are less likely to suffer a heart attack than those who do not engage in such habits. The last strategy is called the life course approach, and it

suggests that a person's experiences and events throughout their lifetime, including early adversity and socioeconomic status, could have an impact on the consequences of their health.This model suggests that early life experiences have the potential to affect health trajectories and increase the likelihood of suffering a heart attack later in life.
The project's goal is to explore the relationship between traditional risk factors, social determinants of health, health practices, and life cycle events, and to evaluate whether or not there is a link between these variables and heart attacks. In addition, the project's objective is to determine whether or not there is a link between these factors and heart attacks. The objective of this study is to analyze the potential interactions that can take place between these risk factors and to determine how such interactions contribute to an increased risk of having a heart attack in the United States.

Risk factors for Heart attack

Ahmed et al., (2020) found that a family history of heart attack, dyslipidemia, and great awareness were all independently connected with each other. The correlation coefficients were as follows: (p=0.04, OR=6.21, 95% CL= 1.081-35.641), (p=0.049, OR=2.11, 95% CL=0.721-6230), and (p=0.009, OR=4.08; 95% CL= 1.427-11.685).These findings were included in Ahmed, A.'s publication. According to the findings of Van Hooser et al, (2020). Have lower levels of education, have lower incomes, be uninsured, live in rural areas, be male, not have a primary health care provider, and not have had a physical examination in the most recent year. Additionally, these Native American individuals were less likely to have had a recent physical examination. It is possible to minimize the burden of heart failure (HF) by utilizing a multimodality technique to promptly identify those who are at risk for developing it and by commencing guideline directed HF treatment in these patients as soon as possible (Jena. et al., 2021). This study was written up by Jena et al. and published in the year 2021 in the journal Heart FailureAtrial fibrillation was named as one of the risk factors for heart attacks by the majority of respondents (53.8%), followed by heart disease (54.1%) and obesity (53.8%). Contrarily, respondents were least likely (only 26%) to acknowledge diabetes as a risk factor.

Smoking a leading cause of heart attack

According to Takahisa et al, (2019). The use of tobacco products continues to be one of the most significant risk factors for cardiovascular disease (CVD), which is now acknowledged as the largest avoidable cause of death across the globe. Although the number of people who smoke tobacco has decreased in nations with high earnings, the average smoking rate in Japan is still fairly high: 29.4% for males and 7.2% for females in 2017. This compares to countries with high incomes where the number of people who smoke tobacco has decreased. It is essential to bring attention to the fact that the average smoking rate among men of middle age is still more than forty percent, which implies that a high incidence of cardiovascular disease caused by smoking will continue to be a concern in Japan for at least the next couple of decades. When it comes to cardiovascular disease, the negative consequences of smoking are far more extensive than was previously thought, which can be attributed to the fact that smoking causes cardiovascular illness. When treating smokers, medical professionals should be especially vigilant for the onset and progression of ischemic cardiovascular disease, heart failure, atrial fibrillation, and venous thromboembolism, in addition to other conditions that are associated with cardiovascular disease.

The trend toward adopting heat-not-burn tobacco as an alternative to smoking cigarettes has given birth to a new issue. This is because heat-not-burn tobacco is becoming more and more popular. Even though tobacco can be ingested in a number of different ways, this does not mean that it is immune to the undesirable consequences that it has. (Takahisa., et al (2019).If you smoke even just one cigarette per day, you are still increasing your risk of getting coronary artery disease (CAD) and stroke. This is true even if you smoke only one cigarette per day. This risk among low-use smokers is substantially higher than was ever supposed to be the case, those who smoke just one cigarette per day have an elevated risk of cardiovascular disease that is between 40 and 50 percent higher than those who consume 20 cigarettes per day. In recent years, there has been a movement away from smoking cigarettes and toward the use of tobacco products that are heated rather than burnt in Japan. These changes have occurred as a result of an increase in the popularity of heated tobacco products. Research by (Hackshaw et al.,2019). Although the focus of this study is on smoking cigarettes, due to the huge amount of information that is currently available in the research literature, much of what is mentioned about smoking cigarettes is also applicable to other forms of tobacco use, such as heat-not-burn tobacco products; the issues stem from the substance itself, rather than the way by which it is

delivered. The risk of developing atherosclerotic cardiovascular illnesses is only one of the many adverse impacts of smoking, which also includes other health problems. There is a connection between smoking, and more specifically ongoing smoking, and an increased risk of being hospitalized for an event of heart failure (HF). According to recently published study, smoking is one of the most significant risk factors for atrial fibrillation (AF), and this is true both for Japanese men and women.As stated in Takasha et al. (2019) research.

In 2010, it was projected that the global prevalence of tobacco use among men was 36.6%, while the prevalence among women was 7.5%. According to the reports of WHO In 2017, the smoking prevalence rates for men in Japan were 29.4%, while the smoking prevalence rates for women were 7.2%. According to findings from a recent poll that were released by the Japanese Ministry of Health and Labor, the smoking rate among men in their middle years is still relatively high, hovering somewhere around 40%. Despite the fact that the general smoking rate in Japan has reduced by half over the course of the previous 30 years, this is still the case. This study shows that Japan will continue to endure a high incidence of smoking-related cardiovascular diseases (CVDs) for a considerable amount of time into the foreseeable future. A major risk factor for cardiovascular disease (CVD), which includes atrial fibrillation and venous thromboembolism (VTE), is smoking cigarettes or other forms of tobacco. There is a correlation between a smoking history and an increased risk of hospitalization for heart failure (HF). By smoking, individuals greatly increases their risk of acquiring cardiovascular disease, as well as hypertension and metabolic syndrome, which are both made worse by smoking. There is evidence to suggest that a person's risk of developing cardiovascular disease can be increased by smoking merely one cigarette per day and by being exposed to secondhand smoke. To this day, there is no convincing evidence to suggest that the use of heat-not-burn tobacco products is a safer alternative to smoking cigarettes in the conventional manner. Locations that do not permit smoking in any form offer protection against cardiovascular disease to both smokers and people who do not smoke.

Researchers Ahmed et al. (2000) conducted a study with a cross-sectional design on a total of 393 people who took part in the study in Kuantan, Pahang, Malaysia. The research was carried out by the researchers in Malaysia. Face-to-face interviews were conducted with individuals of the general community whose ages ranged from 18 to 64 in order to gather the necessary information for the study. In this study, the involvement of healthcare professionals working in clinical or academic settings was neither solicited or required in any way. Utilizing both the chi-square test and the logistic regression analysis was required in order to carry out the statistical inquiry. According to the results of the survey, the vast majority of respondents

identified smoking as one of the behaviors that contributed to an increase in their likelihood of suffering a heart attack. After this, the other variables that increased their probability of having a heart attack were atrial fibrillation (57.7%), heart disease (54.1%), and obesity (53.8%). Diabetes, on the other hand, was the risk factor that just 26% of the participants recognized as a possible threat to themselves, While 9.8% of persons were unable to name any risk factors for heart attacks, 5.6% of participants were able to list every modifiable risk factor for heart attack. The majority of participants, which made up 90.6% of the sample, were able to identify at least one modifiable risk factor for heart attack, while the remaining people were able to identify each and every one of these risk factors. Participants who were between the ages of 46 and 64, respondents who were married, respondents who were Chinese related to have heart attack. Study participants with higher levels of education, and participants who had previously received information all demonstrated a high level of awareness of the eight modifiable risk factors for heart attacks. Those between the ages of 55 and 64, those with a family history of heart attacks, and participants who had already experienced a heart attack all took part in the study($p = 0.04$, OR = 6.21, 95% CL = 1.081-35.641), $p = 0.049$, OR = 2.11, 95% CL = 0.721-6.230), and $p = 0.009$, OR = 4.08, 95% CL = 1.427-11.685. It was shown that having a high degree of awareness was related with an increased risk of developing dyslipidemia.

The significance of recognizing the symptoms of a heart attack and seeking treatment as soon as possible.

It has been demonstrated that cardiovascular diseases, which are often referred to as CVDs, are the leading cause of mortality all over the world. In 2016, around 17.9 million individuals lost their lives as a direct consequence of cardiovascular disorders, as reported by the World Health Organization (WHO). This statistic represents 31 percent of all fatalities that happened all around the world in the year 2016. It is estimated that heart attacks and strokes were responsible for 85.2% of these fatalities (15.2 million). (WHO. 2018). It's a well-known truth that strokes are a major health concern in both poor countries and rich countries. On the other hand, studies have shown that the risk of death increases with the length of time that has gone after the initial beginning of stroke symptoms. This is one of the reasons why early hospitalization is such a significant factor in minimizing the risk of morbidity and mortality. Controlling the risk factors associated with the illness in a more efficient manner can lead to enhanced treatment options as well as improved prevention of strokes. (Intaset., al 2019).

As a result, improving public knowledge about strokes and the risk factors associated with them, such as high blood pressure, diabetes, smoking, stress, and lack of physical activity, is critical. According to the findings by Daks et al. (2019) investigation on this subject, those who have survived a stroke in 2007. On the other hand, coronary heart disease (CHD) Awareness of stroke warning signals and risk factors, both among the public population and within, has made a significant impact to the number of people who have died.

The World Health Organization (WHO) reported that coronary heart disease was the cause of 23.1% (29363) of all fatalities in Malaysia in 2014. Diabetes was the cause of 10.1% (1001) of all fatalities that year. According to Malaysian mortality statistics collected in 2017, ischemic heart disease was responsible for 13.9% of all deaths reported to the the causes of death in malasia, 2018 database in 2017. This was the case for all fatalities in Malaysia in 2017. Myocardial infections (MI) are a time-dependent illness in which patients who are taken to the hospital early have a significantly better outcome; nonetheless, pre-hospital delay has a negative impact on the quality of life of all patients afflicted by the illness. Patients who arrive at the hospital at an early stage have a substantially better chance of surviving. Primary percutaneous coronary intervention, for example, is contingent on the onset of symptoms and the treatment of such symptoms. This is because the symptoms might be treated differently depending on when they appear. As a consequence of this, it is essential to take note of symptoms as soon as it is practical to do so and to seek treatment as soon as it is practical to do so. (Intaset, al 2015).In point of fact, following the beginning of MI symptoms, a delay in reperfusion of even half an hour is associated with a 1.5% increase in the risk of mortality. On the other hand, research has shown that the mortality rate can decrease by 23% when reperfusion takes place within three hours and by 50% when it takes place within one hour after the onset of MI symptoms. (Simoons et al, 1986). In point of fact, coronary heart disease is caused by a number of risk factors that can be changed.

These risk factors include eating and drinking unhealthy foods and beverages (such as fast food, trans fats, and carbonated drinks), being overweight, not getting enough exercise, smoking, drinking too much alcohol, having high blood pressure, diabetes, and high cholesterol. On the other hand, educating people about cardiovascular illnesses (CVDs), such as heart attacks and strokes, and the risk factors that are able to be managed is of the utmost significance. This is due to the fact that it has the ability to lead to an improvement in an individual's lifestyle as well as the incentive to seek medical care at an emergency room. If these steps are taken at an earlier stage, they have the potential to result in a significant decrease in morbidity and death. (Awad and Al-Nafisi, 2014).

However, very little study has been done to examine the general public's understanding of the risk factors for cardiovascular illnesses; this demonstrates how vital it is to explore individuals' knowledge regarding cardiovascular diseases (CVDs). (Amin et al., 2014). In addition, there is a dearth of research that focuses specifically on Malaysia and investigates the general public's understanding of the signs and symptoms of heart attacks and strokes as well as the variables that put them at risk for developing these conditions. However, in order to carry out the primary study, it was required to first derive a questionnaire that was written in both English and Bahasa Melayu (BM), which is the national language of Malaysia which lead to the process of publishing awareness of stroke warning signs and risk factors among the general public and stroke survivors. On the other hand, coronary heart disease (CHD), which has been a significant contributor to deaths, has contributed significantly. In 2014, coronary heart disease was responsible for 23.1% (29363) of all deaths in Malaysia, according to the World Health Organization (WHO). All other causes of death contributed to these fatalities. According to 2017 statistics on the causes of death in Malaysia, ischemic heart disease was responsible for 13.9% of all fatalities reported to the the causes of death in malasia, 2018 database. This was the case for all fatalities that were recorded in 2017.

Heart attack, physical activities (PA), and BMI as risk factors

A study that was conducted out by Roger et al. (2012) came to the conclusion that around 5.8 million people are affected with heart failure (HF), which is the cause of an estimated annual cost of treating $34.8 billion. Heart failure with maintained ejection fraction, also known as heart failure with maintained ejection fraction (HFpEF), can account for up to half of all cases of heart failure.

This type of heart failure is analogous to heart failure with decreasing ejection fraction, or HFrEF. Unfortunately, HFpEF has also been linked to a variety of unfavorable clinical consequences. Dhingra et al, (2016). Large randomized trials of many pharmacological interventions for individuals with HFpEF have been unsuccessful in improving clinical outcomes, in contrast to studies that were conducted on patients with HFrEF. (Massie al et2008). Because HFpEF is still unresponsive to the treatments that are already on the market, focusing on primary prevention is an essential component of the measures that are being developed to reduce the increasing burden that this disease places on populations.

The process of finding modifiable risk variables that can be addressed with effective preventive approaches is a key stage in the process of preventing HFpEF. The abbreviation for "heart failure with preserved ejection fraction" is "HFpEF." Factors associated to a person's manner of life, notably their weight and whether or not they lead an active lifestyle, have a substantial influence to the etiology of heart failure. To be more specific, researchers found a linear dose-dependent negative relationship between leisure-time physical activity (LTPA) and the risk of heart failure in a recent meta-analysis; higher levels of LTPA, above the guideline recommended minimum doses, were associated with a lower risk of heart failure. In other words, the risk of heart failure decreased with increasing levels of LTPA (Hej, et al., 2001). In a similar vein, it has been shown that there is a strong correlation that exists between rising levels of body mass index (BMI) that are outside of the normal range and the risk of heart failure (HF). This finding is in line with earlier research that found a link between high blood pressure and the risk of stroke. This association is dose-dependent as stated by(Aune, et al 2016). On the other hand, it is not clear if this dose–response link is the same for HFpEF as it is for HFrEF. As a consequence of this, the exact impact that different doses of LTPA and levels of BMI have on the various types of heart failure is unknown. As a consequence of this, the ideal goal targets that should be reached in order to avoid HFpEF are also not yet defined.

The direct influence that LTPA and fitness have on the underlying pathophysiological reasons of the formation of HFpEF may be more directly connected with the likelihood of developing HFpEF, as stated by (Padney et al., 2015). Systemic inflammation, the structure and function of the heart, visceral obesity, and the absorption and use of oxygen in peripheral (skeletal muscle) tissue are some of the variables that contribute to this condition. Recent research has revealed that a lack of cardiorespiratory fitness or physical activity (PA) is strongly associated to diastolic dysfunction, which can also lead to a loss in left ventricular compliance. This dysfunction can occur when the left ventricle of the heart is not as compliant as it should be. These are the two cardiac variables that are considered to be the most essential in the development of HFpEF; nevertheless, systolic function is not one of them. (Brinker et al., 2014).In a similar line, research has shown a link between exercise training and greater levels of LTPA and lower levels of visceral adiposity, as well as lower levels of systemic inflammation, and enhanced skeletal muscle performance. This is all due to the fact that exercise training improves skeletal muscle function. (Irving et al., 2008). It is likely that in order to acquire the necessary pleiotropic effects and minimize the chance of developing HFpEF, doses of LTPA that are significantly higher than those recommended in the most current guidelines will be required.

This is because the most recent guidelines did not take into account the fact that HFpEF is more likely to occur in patients who take these higher dosages. In addition, we discovered a substantial dose–response link between a person's body mass index (BMI) and the likelihood of developing heart failure with retained ejection fraction or heart failure with reduced ejection fraction. Both of these forms of heart failure are characterized by a decrease in the amount of blood that is able to be ejected from the heart. The body mass index (BMI) was found to have a connection to both forms of heart failure. An increased risk of heart failure with preserved ejection fraction was connected to higher BMI levels that were outside the normal range. It was shown that the dosage had an effect on this connection.This link was revealed to have a greater degree of significance than the one that existed between BMI and the possibility of HFrEF, as shown by the findings of the study.

In accordance with the dose–response paradigm, we found a correlation between LTPA, BMI, and the chance of developing heart failure. The link between physical activity (PA), body mass index (BMI), and the risk of heart failure with preserved ejection fraction (HFpEF) was more consistent and dose-dependent when compared with the risk of heart failure with preserved ejection fraction (HFrEF). This was the case, according to these findings. Different patterns of living in the community might potentially play a part in the prevention of HFpEF to some degree. These findings may potentially have implications for the development of future guidelines that are intended to seek to lower the frequency of HFpEF among the general population. Randomized preventive trials of a format that is appropriately organized are necessary in order to further test this notion and identify its significance for clinical and public health management. (Intas et al., 2019).

Is there a link between drinking alcohol and having an increased risk of heart attack?

Alcohol has a hormetic physiological behavior that, according to Gemma and Bedimon (2019), can influence a person's risk of cardiovascular disease in one of two ways, depending on how much is consumed, how frequently, how it is consumed, what outcomes are being looked at, and even what kind of alcohol is consumed. This is a possibility regardless of the sort of alcohol that was previously drank. To explain how alcohol influences cardiovascular health and the overall burden of diseases, however, the great majority of studies rely on epidemiological studies of the associative kind. Due to the nature of the research, these studies are subject to a number of restrictions. As a result of this, the benefits to one's cardiovascular health that come from drinking low to moderate amounts of alcohol are coming

under scrutiny, and it's possible that such benefits were overstated in the past. As a direct result of this, the goal of this study was to carry out a complete analysis and give a detailed discussion of the present state of knowledge about the connection between alcohol use and cardiovascular disease.In addition to the findings of recent research that indicate a link between low to moderate alcohol consumption and a lower risk of cardiovascular disease, many questions concerning the precise amount of alcohol that can be consumed safely, the type of alcoholic beverage that can be consumed, and variations in alcohol consumption that are caused by age, gender, genetic differences, and ethnic differences remain unanswered. In Europe, cardiovascular disease, often known as CVD, is the main cause of death, accounting for 47% of the overall mortality rate. Other common abbreviations for CVD include coronary heart disease and stroke. The World Health Organization estimates that cardiovascular disease is responsible for 31% of all fatalities worldwide, making it one of the main causes of death.

Smoking, having high blood pressure, having dyslipidemia, and having an unhealthy diet are some of effect of alcohol on cardiovascular disease have produced conclusions that are inconsistent with one another, alcohol intake has been the topic of a great deal of debate in connection to health care systems. Smoking, having high blood pressure, having dyslipidemia, and eating a poor diet are all risk factors that can be minimized. Contrary to the findings of the vast majority of studies, which suggest that low to moderate alcohol consumption may be beneficial for the cardiovascular system by lowering the risk of major adverse cardiovascular events (MACE), excessive alcohol consumption has been shown to increase the risk of cardiovascular disease (CVD) and is linked to an increased risk of morethan 50 diseases. Additionally, research has shown that low to moderate alcohol use can lower the risk of major adverse cardiovascular events (MACE). This viewpoint is supported by evidence presented by Ronkley et al. (2011) and Mormot et al. (2019), respectively. Alterations can also be made to other risk factors, such as quitting smoking, lowering blood pressure, improving cholesterol levels, and improving lipid profiles. In contrast to the findings of the vast majority of research, which suggest that there may be health benefits associated with low to moderate levels of alcohol intake or that it is at least not harmful for the cardiovascular system, excessive alcohol consumption has been found to raise the risk of cardiovascular disease (CVD).(Ronkley et al., 2011).

According to Flipsnack et al (2019). Cardiovascular disease is not only the main cause of death in Europe (it is responsible for 47% of the overall mortality rate), but it is also one of the principal causes of death globally (it is responsible for 31% of all deaths). Numerous studies, such as the one published in Framingham Heart by Mahmood et al. (2014) and the one published in INTERHEART by Yusuf et al. (2004), have shown that risk factors account for ninety percent of

acute myocardial infarctions (AMIs), which are also known as heart attacks. These risk factors may be modified. As a result, lowering the risk factors for cardiovascular disease ought to be of the highest significance on a national as well as a worldwide scale. High blood pressure, abnormal cholesterol levels, high blood pressure, and smoking are some more risk factors that may be modified. As a result of the fact that the findings of various research on the effects of alcohol on cardiovascular disease have produced conflicting results, the use of alcoholic beverages has been the subject of intensive discussion in relation to health systems. In contrast to the findings of the vast majority of studies, which indicate that low to moderate alcohol consumption may be beneficial Ronkley et al (2011) or at least not harmful according to Mormot et al (2019) for the cardiovascular system by lowering the risk of major adverse cardiovascular events (MACE), excessive alcohol consumption has been shown to increase the risk of cardiovascular disease, and it is associated with an increased risk of more than 50 disabling diseases. Furthermore, studies have connected heavy alcohol consumption to an increased risk of dying from cardiovascular disease.

In point of fact, consuming alcohol causes physical ailments, in addition to the mental disorders that are associated to dependence on alcohol and are produced by it. These diseases include: depression, anxiety, cirrhosis of the liver, Parkinson's disease, and liver cancer. According to Cheng et al (2019), cigarette smoking was the seventh leading cause of mortality and disability-adjusted life years in 2016. This information was obtained from the study's researchers. It was responsible for 6.8% of all age-standardized male deaths and 2.2% of all age-standardized female deaths in the United States. Grisworld et al. (2019) discovered that it is a significant contributor to the worldwide illness burden, and their findings were backed by evidence.In order to evaluate the effects of alcohol use on cardiovascular disease and or the state of general health, it is important to first ascertain the quantities of alcohol that are consumed. This is due to the urgent need for study into the ways in which drinking alcohol affects not only cardiovascular disease but also overall health. Even though the National Institute for Alcohol Abuse and Alcoholism in the United States classifies drinking levels as low-risk drinking, moderate alcohol usage, binge drinking, and excessive alcohol use, other studies have produced their own definitions for these categories. This is the case despite the fact that the National Institute on Alcohol Abuse and Alcoholism in the United States classifies drinking levels as such. The drinking of alcohol on an occasional basis is referred to as low consumption, and it can reach the same maximum quantity as moderate consumption. On occasional consumption days are interspersed with days on which no alcohol is drunk at all. The term "moderate consumption" refers to the quantity of alcohol that is consumed on a daily basis, while "occasional use" refers to the amount of alcohol that is used on an as-needed basis and can reach the same maximum as "moderate use." The term "regular

daily consumption" is one that is used to indicate a consumption level that is considered to be reasonable.

The majority of research on the effects of alcohol on cardiovascular disease has been conducted on adult cohorts that are older than 35 years old. Because of this, the conclusions that have been drawn about the effects of drinking over the course of a whole lifetime may be inaccurate. In addition, the vast bulk of the research that has been done on the relationship between alcohol and cancer has been conducted on cohorts of persons who are younger than 35 years old. It has been demonstrated that a person's drinking habits change throughout the course of their lives. According to Britton et al. (2015), binge drinking reaches its highest point in a person's 20s, which corresponds with this era of heavy alcohol use (during which, interestingly, CVD controls are rare), and then it drops until it reaches its lowest point in a person's 40s. The goal of this research was to investigate the connection between heavy drinking and binge drinking, or drinking excessive amounts of alcohol. The individual will reach their lowest point in their 50s, at which point this process will come to an end. It will continue until that moment. At a young age, Charakida et al. (2019) found that excessive and irregular binge drinking (>60 g alcohol) is associated with increased arterial stiffness as well as a 45% increased risk of ischemic heart disease. This discovery was made by the researchers at a relatively young age. These results were presented in an article that was published in the journal Circulation. When excessive and irregular binge drinking is compared to normal drinking, the risk of developing ischemic heart disease is increased by 45%. In other words, the risk of developing ischemic heart disease is increased by 45%.

These individuals, who were considered to be abstainers in prior research, may in fact have a higher cardiovascular risk than lifetime moderate drinkers, as suggested by Russell et al. (2019). This may be due to the fact that Russell et al. (2019) exaggerated the frequency with which youth and young adults engage in heavy drinking and binge drinking. According to the findings of this study, those who consumed a significant amount of alcohol or who binge drank on a regular basis when they were in their twenties are more likely to have given up drinking beyond the age of 35. In a cross-sectional study, Goldwater et al. (2019) found that low drinkers, moderate drinkers, and heavy drinkers all had much lower allostatic load ratings than longterm former low drinkers or abstainers. This was the case regardless of the amount of alcohol consumed.This score is related with a decreased risk of both cardiovascular disease and overall mortality.

On the other hand, it is impossible to deny that drinking excessively or binge drinking on a regular basis is harmful on all fronts. This holds true regardless of how often the occurrence in question takes occurs. According to Puddey et al. (2019), it has been extensively linked to an increased risk of diabetes, hypertension, ischemic and hemorrhagic stroke, cardiomyopathy, and atrial

fibrillation. Furthermore, it has been linked to an increased mortality following an acute myocardial infarction. Moreover, it has been linked to an increased risk of diabetes. This is most likely the result of consuming alcohol, which is known to produce an increase in blood pressure. In addition, there is a connection between drinking heavily on an irregular basis (to levels of alcohol consumption per month that are equivalent to those of moderate drinkers) and an increased risk of overall cardiovascular disease. This association was shown in a study conducted by the American Heart Association. This is owing to the fact that drinking to excessively has a negative impact on lipid profiles, which can generate arrhythmias in addition to rises in blood pressure. This is due to the fact that binge drinking has a negative impact on an individual's lipid profile. Even in countries with the highest alcohol consumption per capita, chronic heavy drinkers and irregular binge drinkers make up a minority of drinkers worldwide, according to the findings of Rehm et al (2017). In addition to the amount of alcohol that is drank, the food that is eaten alongside it may also play a significant role in determining the outcome.

According to the findings of Mukama et al. (2003), drinking alcohol is related with a decreased risk of acute myocardial infarction (AMI) when the beverage is consumed with food or throughout the course of a meal. This was found to be the case regardless of whether the beverage was consumed before or after the meal. This is the conclusion that can be drawn from the data of the study. According to study that was conducted in 2019 by Matshipi et al., it was just recently established that consuming energy drinks with other beverages might result in an elevated risk of cardiovascular disease (CVD). This is due to the fact that there is evidence to suggest that energy drinks, particularly among teenagers who are more likely to engage in binge drinking, enhance the intake of greater quantities of alcohol, diminish the feeling of being intoxicated, and lead to impaired driving, dangerous sexual behavior, and alcohol dependency.

This is especially true among teens who are more likely to engage in binge drinking. This holds especially true for young people, who are more likely to participate in risky drinking behaviors like binge drinking. There appears to be two distinct stages in the connection between alcohol use and cardiovascular disease: one that is advantageous at low and moderate intakes, and another that is deleterious at large intakes, even when consumed very rarely. Both of these stages seem to occur simultaneously. It would indicate that the quantity of alcohol consumed has an effect on both times periods.The intake of alcoholic beverages was a factor in each of these times. It is not the case, despite the fact that a huge number of specialists are of the belief that the unfavorable effects of drinking alcohol, particularly in small amounts, significantly outweigh the positive effects that can result from alcohol use, but this is not the case.

According to the data that is now available, consuming alcohol in moderation is not only perfectly safe, but it also has beneficial benefits on the cardiovascular system of a person. This is the case even when compared to binge drinking. (Albert et al 2019). Because of the obvious ethical and logistical considerations involved, epidemiological research with an associative emphasis constitutes the great majority of the evidence that is now available. This is because this approach is the most productive one that is currently accessible. However, these studies have a number of flaws, one of which is that they are unable to assess the amount of alcohol that was drank. This is only one of the limitations that these studies have. In the future it will be necessary for these investigations to include reliable evaluations of biological signs of alcohol exposure. One example of such an indication is the presence of ethyl glucuronide in the urine, which may be able to more accurately represent short-term and routine alcohol use than the individual's own self-reported intake does. These studies must also incorporate a number of time-lapse measurements that must be done on several occasions. (Van de Luitgaarden et al. 2019). It is essential to keep in mind that in spite of the cardioprotective effects of low or moderate alcohol consumption, these benefits may be weighed against the risks from the perspective of the individual as well as in the context of dealing with serious issues such as the propensity for alcohol dependence and the associated social harms, genetic susceptibility, pregnancy, or even a family history of cancer. It is very important to keep this in mind because it is important to remember that these advantages can be weighed against the disadvantages from the perspective of the individual because of its significance, remembering this is absolutely necessary. It is imperative that the fact that these benefits may be evaluated against possible hazards, both from the perspective of the person and in the context of resolving major issues, be underlined. It is essential to emphasize that this is something that can be accomplished. On the other hand, drinking to excess and participating in binge drinking should absolutely not be tolerated under any circumstance. Regardless of whether there are any exemptions or justifications, this ought to be the rule in every circumstance.
In the same vein, national and international guidelines need to be modernized in terms of both the manner in which they are applied and the degree to which they reflect contemporary practices. In spite of this, the consumption of alcoholic beverages is rising at a startlingly rapid rate all over the world. According to statistics provided by the World Health Organization (WHO), approximately half of all adults over the age of 15 participate in this behavior.

The 2018 Global Status Report on Alcohol use and Health published by the World Health Organization stated a lot about abuse of alcohol.As a result of the fact that randomized controlled trials on a broad scale have not been able to be conducted at this time, there are still a number of questions that have not been answered in regard to public health, including the following:

(1) What is the smallest amount of alcohol that one may consume on a daily basis and still be considered to be safe, all while providing real advantages to the heart? (2) Which variety of alcoholic drink is considered to have the most health advantages?

(3) Are there differences in the effects of alcohol based on factors such as geographical location, the socioeconomic conditions of the countries in which it is consumed, as well as racial and ethnic characteristics?

(4Is there a link between the age of the drinker and the intensity of the negative consequences that alcohol intake has?

(5) Do age-related disparities in the pathophysiological effects of alcohol intake between men and women become less apparent?

According to Abat et al (2019), this is of particular significance when taking into consideration the fact that the vast majority of illness endpoints that can be connected with alcohol intake are also linked to aging. This highlights the significance of the connection between alcohol consumption and the aging process.Taking this into consideration makes the significance of this argument even clearer.When thinking about where the evidence comes from, it is especially important to keep in mind that the vast majority of the data comes from countries with the greatest average life expectancy. This is because these countries have the longest living populations.This is a very crucial point because of these two things taken together. Even though drinking is a common practice throughout a wide range of cultures, it would be wise to suggest that current drinkers limit their intake to low to moderate levels. Never should drinking be encouraged in an effort to enhance health outcomes.

Acute versus Chronic Alcohol Consumption

The quantity of alcohol consumed as well as the pattern in which it is consumed have a significant impact, not only on the short-term but also on the long-term health impacts of drinking, which can be acute as well as chronic (accumulative). According to Mostofsky et al. (2016), a person's drinking habits and their tolerance to alcohol may also have a role in determining how they react acutely to alcohol. Guzzo-Merello et al. (2014) found that more commonly after more than ten years of alcohol misuse, the clinical signs of alcohol-induced cardiac injury are present. Consumption of alcohol that is not only recent but also binge-like or excessive is connected to the development of acute arrhythmias as well as the decrease of ventricular function. On the other hand, the clinical indications of alcohol-induced heart disease begin to develop more commonly after excessive drinking for more than ten years. According to the findings of study that was carried out by Russell et al. (2014), the risk of cardiovascular disease (CVD) and, more particularly, the risk of acute myocardial infarction (AMI) is not determined

by the total quantity that is consumed but, rather by the patterns of drinking that an individual engages in. According to this line of reasoning, Mukamal et al. (2003) discovered that subjects who drink the same amount of alcohol each week on a regular basis (moderate consumption) have a lower CV risk than those who binge drink irregularly (one to two days per week with a similar total amount of alcohol as excessive drinking).

Moderate consumption refers to drinking the same amount of alcohol each week on a regular basis.Consuming alcohol in a regular and consistent manner at the same level each week is an example of moderate consumption. A recent analysis of 23 studies on alcohol consumption found that the risk of major adverse cardiovascular events may vary depending on the amount of alcohol consumed as well as the time it is consumed. The risk increases after one hour of consumption, even in moderate amounts, and decreases after 24 hours or one week of consumption of alcohol.After one hour of intake, there was an elevated risk of significant adverse cardiovascular events, which led the researchers to conclude that this is the correct interpretation of their findings. This conclusion was reached as a result of the observation that the risk of significant adverse cardiovascular events was increased after one hour of consumption compared to the risk after modest amounts were consumed.Futthermore, this conclusion was reached after taking all of these factors into consideration, including the fact that the risk of significant adverse cardiovascular events may vary not only with the amount of alcohol that is consumed but also with the length of time that alcohol is consumed during the course of a drinking session. Drinking alcohol is associated with both the short-term and the long-term risks of AMI, as determined by the findings of the same meta-analysis that was carried out by Mostofsky et al. (2016).The highest degree of risk was shown when nine drinks were had in a single day, whereas the best level of protection was observed when around two drinks were consumed each day.Unfortunately, this is what the research carried out by Mulia et al. (2017) found.

In epidemiological studies and clinical trials that relate drinking alcohol to cardiovascular disease, the vast majority of participants are white men; the number of white females who take part in these studies were far lower. Because of this, it's likely that the findings can't be applied to groups that aren't composed entirely of white people. This is a possibility, Even though people of various cultures and ethnicities may have distinctive drinking habits and ways of life, the protective effects that are linked to low or moderate alcohol use vary significantly between cultures and ethnicities. This is partly due to genetic variations in the enzymes that metabolize alcohol. Additionally, this variation is due to the fact that people of different cultures and ethnicities may have different ways of life, Published in 2017 by Mulia et al. According to O'Keefe et al. (2018), the cohorts of white and Hispanic individuals had a lower risk of death from all causes than the cohorts of black, indian, or Chinese people. This was true for both males and women in the population. The significance of this result cannot be overstated.

These differences were also found in the risk of coronary heart disease, where it was revealed that drinking alcohol, regardless of the quantity drunk, conferred a protective advantage on White people but did not have this influence on Black people. This was found to be the case despite the fact that alcohol consumption provided a protective effect on White people regardless of the amount taken. This was the situation for both males and females. This result was of critical significance. These differences were also seen in the risk of coronary heart disease, where it was revealed that drinking alcohol, regardless of the quantity drunk, conferred a protective advantage on White people but did not have this influence on Black people. This was shown to be the case despite the fact that drinking alcohol conferred a protective benefit on White people regardless of the quantity consumed.

A Japanese cohort of non-obese patients exhibited better evidence of the cardioprotective benefits of moderate alcohol use, according to a study that was conducted by Makita et al. (2012). It has been demonstrated that consuming alcohol in moderation can lower the risk of cardiovascular disease (CVD), but drinking to excess or drinking heavily is connected with the same unfavorable health effects no matter where in the globe you live.Krokstad et al. (2017) conducted a population-based study on Korean adults and discovered that drinking five or more alcoholic beverages per week was related with an increased risk of mortality from both cardiovascular and non-cardiovascular causes.

This was discovered after the researchers observed that drinking five or more alcoholic beverages per week was connected with an increased risk of mortality. These results were presented in an article that was published in the journal Circulation. Other epidemiologic observations from diverse places, including Norway and Australia, have confirmed these patterns. Additional these study are necessary nevertheless, to guarantee that these results can be applied to a wide range of cultures and ethnicities.

CHAPTER III

Methodology

Research Design

The demographic pattern that was utilized as the foundation for the modeling that was done for this research was what led to the usage of the cross-sectional study design. The Behavioural Risk Factor Surveillance System (BRFS), which is the most advanced health-related telephone survey system in the USA, collected data in the year 2015 on state-level health-related risk behaviors, chronic health concerns, and usage of preventative services among people living in the United States of America. People in the United States of America were interviewed with the purpose of gathering this information. In order to collect these statistics, interviews were conducted with people who were already living in the United States at the time.

Participants/Population and Sample

The BehaviouralRisk Factor Surveillance System (BRFSS) is the largest health survey system that is permanently ongoing. Each year, 441,456 adult interviews are carried out as part of this survey. The total number of elements in the behavioral risk factor surveillance system (BRFSS) including all of their data is 253,680.

Data Collection Tools/Materials

The data that were obtained from conversations held on both mobile and landlines during the course of the interviews that were conducted were used. Data will be parsed through in order to classify socio-demographic factors such as age, ethnicity (whether of Hispanic, Latino/Latino, or Spanish ancestry or not), education, smoking status (present smoker or not), body mass index, and annual family income. Questions on the respondent's exercise routines and the quantity of fruits and vegetables they consume were asked in order to obtain insight into the respondent's way of life by gaining knowledge of the respondent's lifestyle. For the 2015 BRFSS, researchers are relying on individuals to self-report their chronic conditions by responding to questions about the most recent time they experienced symptoms.If the response to the following question, "Has a doctor, nurse, or other health professional ever told you had a heart attack, also known as a myocardial infarction?" was

"yes," then the person in question had a heart attack. Myocardial infarction and heart attack are both terms for the same event. A heart attack is also sometimes referred to as a myocardial infarction. If the responder indicated that they had a heart attack by answering "yes" to this question, this is evidence that the respondent had one.

Data Analysis Procedures

In order to do the analysis on the data, the version 26 of the SPSS program was utilized. The data were validated to ensure that they were complete, and they were also cleansed. Validation and cleaning go hand in hand. In order to fulfill the objective of defining the variables, descriptive statistics such as frequency and mean were applied as part of the analysis. In order to present the data, pie charts, bar graphs and tables were used and the data was cleanse to provid support or not for the hypothesis. In the portion of the report that is devoted to the analysis, a chi-square test is carried out, and a significance level of 0.05 or lower is taken into consideration. In addition, binary logistic regression was performed, and variables with P-values of 0.1 or lower were taken into consideration as potential candidates for multiple logistic analysis. This was done so as to narrow down the field of probable options. Following that, multiple logistic regressions were carried out, and the adjusted odds ratio (AOR), in addition to its 95% confidence interval, was investigated. Variables that had a P-value that was lower than 0.05 were taken into consideration to be statistically significant.

CHAPTER IV

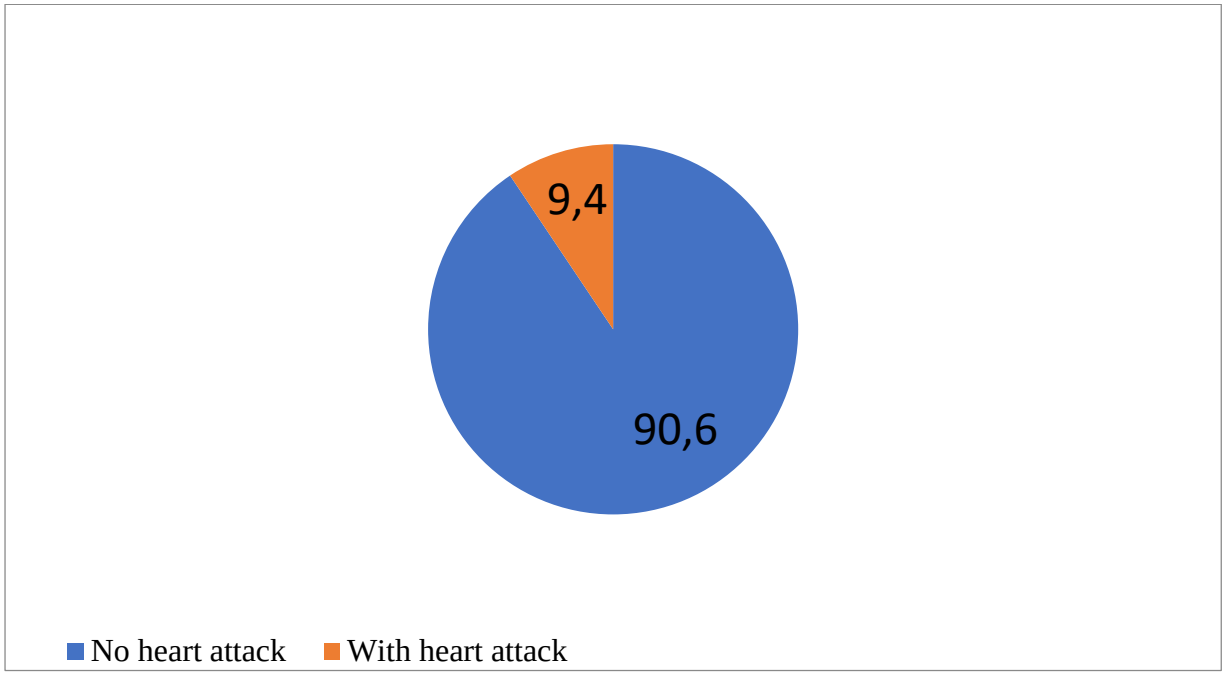
Findings andDiscussion

In this chapter, the researcher describe the findings that were derived from the data that was gathered.

Findings for Prevalence of heart attack

Figure 1

Illustrating the prevalence of heart attacks (n=253680).



It is anticipated that 23,893 participants suffer a heart attack in their lifetime, which equates to 9.4% of the population. The vast majority of those who took part in the study, 229787 persons in total, or 90.6%, had no history of having a heart attack in the past. The fact that the, total number of people who have had a heart attack is 23 893, which is 9.4% of the population. There is a correlation between the respondent's age, level of education, income, smoking status, excessive alcohol intake, high cholesterol level, body mass index, and degree of physical activity, as shown by a p-value that is less than 0.001.

Table 1:
The socio-demographic characteristics of the individuals who took part in the study (n = 253,680).

Variable		Number	%
Age	<45 years	54401	21.4
	>= 45 years	199279	78.6
Sex	Female	141974	56.0
	Male	111706	44.0
Educational level	Never attended school	174	1
	Elementary	4043	1.6
	Grades 9 through 11	9478	3.7
	High school graduate	62750	24.7
	Some college (technical school)	69910	27.6
	College graduate	107325	42.3
	Never attended school	107325	42.3
Income	Less than $15,000	21594	8.5
	$15,000 to $25,000	36129	14.2
	$25,000 to $35,000	62353	24.6
	> $35,000	133604	52.7

There are 141974 females, which accounts for 56%, and 111706 males, which accounts for 44%. In terms of educational attainment, the vast majority (107325, or 42.3%), attended college for four years or more and achieved the level of college graduate. In addition to this, 133604 people (52.7% of the total) had an income of $35000 or more.

Table 2:
Descriptive statistics of the factors related to heart attack (n=253680)

Variable		Number	%
Smoking	No	141257	55.7
	Yes	112423	44.3
Heavy Alcohol consumption	No	239424	94.4
	Yes	14256	5.6
Cholestrol check up	No	9470	3.7
	Yes	244210	96.3
Stroke	No	243388	95.9
	Yes	10292	4.1
Friut intake	No	92782	36.6
	Yes	160898	63.4
Vegetable intake	No	47839	18.9
	Yes	205841	81.1
Receiving any health care	No	12417	4.9
	Yes	241263	95.1
Difficulty of walking	No	211005	83.2
	Yes	42675	16.8
Body mass index	<18.5 kg/m2	211005	1.2
	18.5-24.99%	42675	33.9
	25-29.99 kg/m2	91176	35.9
	>30 kg/m2	73278	28.9
Physical activity	No	61760	24.3
	Yes	191920	75.7

Regarding the elements that put people at risk, there are around 112423 people who smoke (44.3%). usage of alcohol is another risk factor that has been observed, however only 14256 (5.6%) of people meet the criteria for excessive alcohol usage. More than 244210 (96.3% of the population) had undergone a cholesterol screening, and around 243388 (95.9%) reported having no previous history of stroke.

In terms of feeding, 160898 (63.4%) of the participants had a history of consuming fruit, whereas 205841 (81.1%) of the participants had consumed vegetables. A little less than 95% of the people who participated in the research had undergone some kind of medical treatment. In addition to that, around 17% of people had a history of difficulties walking.

According to the findings of the research, around 1.2% of the persons who took part in the study had a body mass index that was lower than 18.5 kg/m2, which is considered to be underweight. In addition, around 29 percent of the persons who took part in the research suffered from obesity. According to the results of the study, 24.3% of the people who took part in it did not take part in the physical activity.

Findings for factors related heart attack

Table 3:

Factors and their associations with heart attack

Variables		Heart Attack		p-value
		Yes	No	
Sex	Female	131769	10205	<0.001
	Male	98018	13688	
Age	Age			
	<45	53648	753	<0.001
	>= 45	176139	23140	
Educational status				
	Never attended school	145	29	<0.001
	Elementary	3265	778	
	Grades 9 through 11	7860	1618	
	High school graduate	55283	7467	
	Some college (technical	62992	6918	
	school)	100242	7083	
	College graduate			
Income				
	<15000$	17844	3750	<0.001
	15000-25000$	30782	5347	
	25000-35000$	55546	6807	
	>35000$	125615	7989	

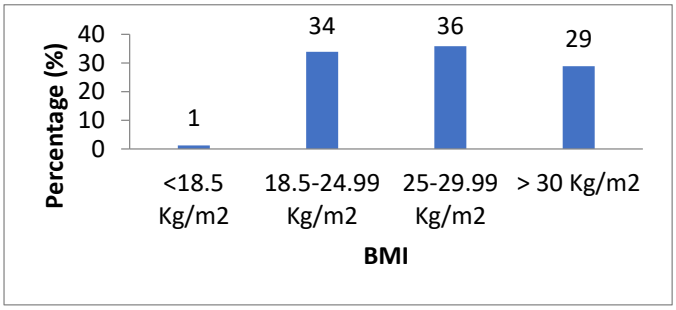
Table 3 continued Variables		Heart Attack		p-value
		Yes	No	
BMI	<18.5	2796	331	<0.001
	18.5-24.9	79893	6206	
	25-29.9	82418	8758	
	>30	64680	8598	
Smoking				
	No	132165	9092	<0.001
	Yes	97622	14801	
High alcohol consumption				
	No	216379	23045	<0.001
	Yes	13408	848	
High cholesterol				
	No	138949	7140	<0.001
	Yes	90838	16753	
Physical activity				
	No	53167	8593	<0.001
	Yes	176620	15300	
Receiving any health care				
	No	11547	870	<0.001
	Yes	218240	23023	
Stroke				
	No	223432	19956	<0.001
	Yes	6355	3937	
Fruit intake				
	No	83337	9445	<0.001
	Yes	146450	14448	
Vegetable intake				
	No	42198	5641	<0.001
	Yes	187589	18252	
Difficulty of walking				
	No	197027	13978	<0.001
	Yes	32760	9915	

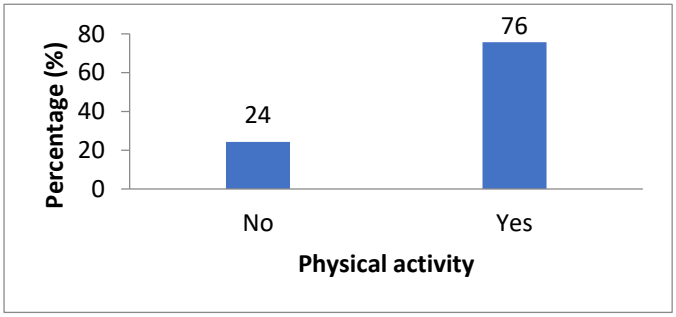
In order to evaluate the relationship between heart attack and the variables that are linked with them, an independent chi square test was carried out. In order to investigate the nature of the connection between heart attack and cigarette use, a Chi-Square Test of Independence was carried out. There was a substantial association between the two variables, as shown by the calculation $X^2(1, N=253680) = 3322.39$, which yielded a significance level of $p<0.001$People who smoked had a higher chance of having a heart attack when compared to people who did not smoke at all. In addition, there is a considerable link between sex and having a heart attack, as demonstrated by the statistic $X^2(1, N=253680) = 1880.387$, which was found to be statistically significant ($p<0.001$). There is a link between sex and heart attack because of the large relationship that exists between the two,It is more probable for men to have a heart attack than it is for women. In addition, age ($X^2(1, N=253680) = 5239.792$, $p<0.001$), educational status ($X^2(5, N=253680) = 2589.790$, $p<0.001$), income ($X^2(3, N=253680) = 4841.039$, $p<0.001$), body mass index ($X^2(3, N=253680) = 962.133$, $p <0.001$), high alcohol consumption ($X^2(1, N=253680) = 213.205$, $p <0.001$), physical activity ($X^2(1, N=253680) = 1933.324$, $p <0.001$), receiving any health care ($X^2(1, N=253680) = 89.034$, $p <0.001$), stroke $X^2(1, N=253680) = 10454.099$, $p <0.001$), fruit intake $X^2(1, N=253680) = 99.356$, $p <0.001$), vegetable intake $X^2(1, N=253680) = 389.167$,

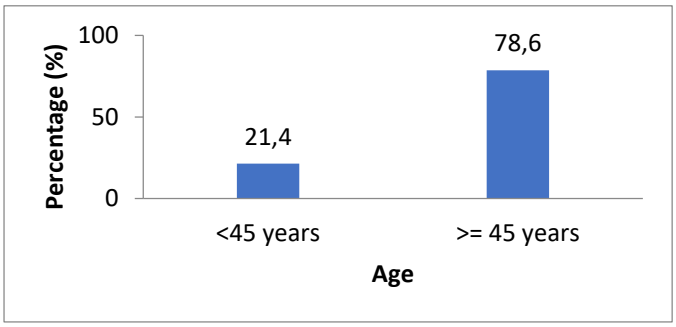
$p <0.001$) and difficulty of walking $X^2(1, N=253680) = 11477.75$, $p <0.001$) have significant relationship with heart attack history.

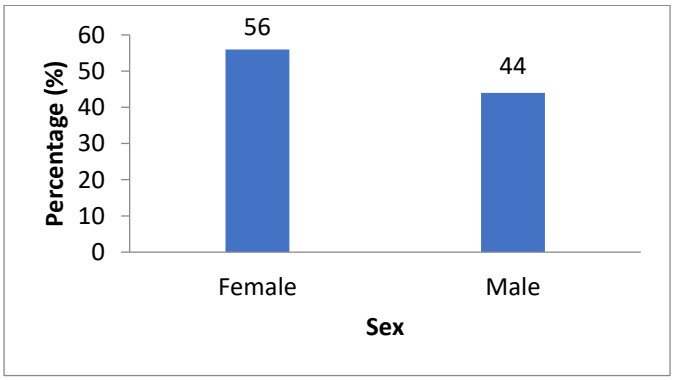
The graph decribes study variable with pictorial presentation. Majority of study participants 76%, 78.6%, 52.7% , and 94.6% were performing physical activity, age >45 years, income > 35000$, and had cholesterol check up respectively (Figure 2).

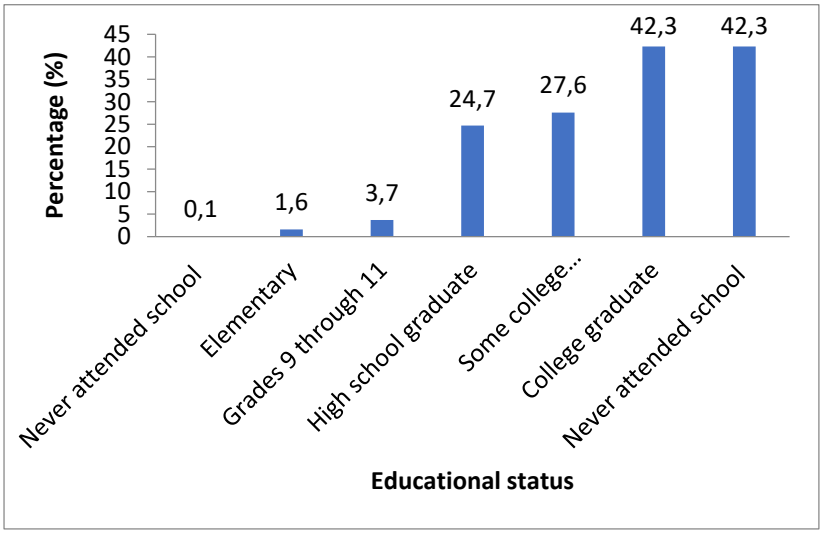
Figure 2:
Graphical representation of study variables (n = 253,680).

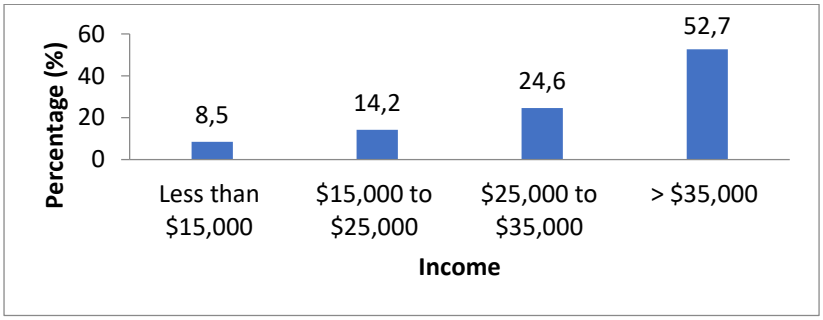


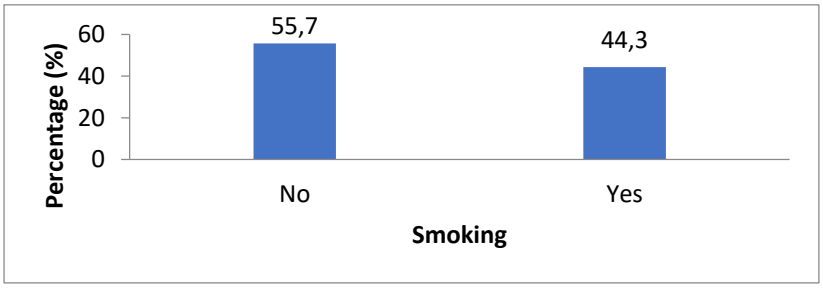


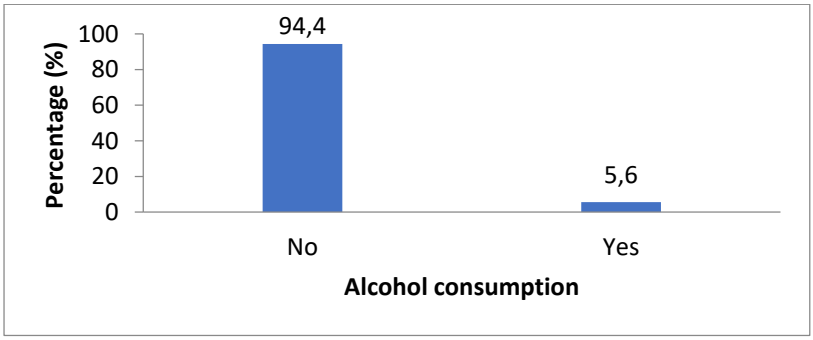





Percentage (%)
45
40
35
30
25
20
15
10
5
0
0,1
1,6
3,7
24,7
27,6
42,3
42,3
Never attended school
Elementary
Grades 9 through 11
High school graduate
Some college...
College graduate
Never attended school
Educational status


Percentage (%)
60
40
20
0
8,5
14,2
24,6
52,7
Less than $15,000
$15,000 to $25,000
$25,000 to $35,000
> $35,000
Income


Percentage (%)
60
40
20
0
55,7
44,3
No
Yes
Smoking


Percentage (%)
100
80
60
40
20
0
94,4
5,6
No
Yes
Alcohol consumption


Percentage (%)
150
100
50
0
3,7
96,3
No
Yes
Cholesterol check up

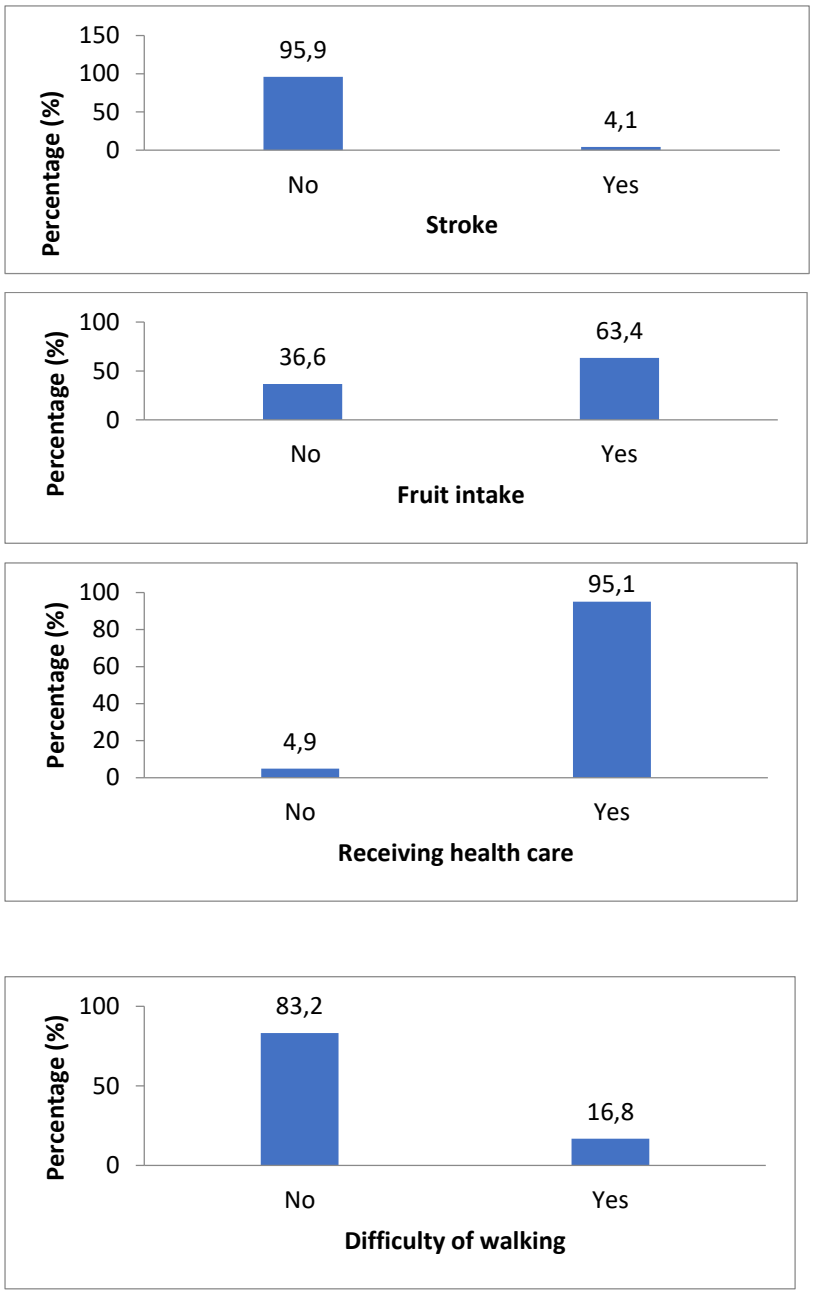


Figure 2, shows the the graphical representation of the study variables. It was observed that slight majority (36%) of the population had BMI between 25 and 29.99 kg/m², 76% answered yes to PA, 78.6% of the participants were above 45 years, 56% of the population were female, 42.3% were university graduates, 52.7% had income greater than $35,000. Moreover, 55.7% answered no to smoking, 94.4% said no to smoking, 96.3% said yes to cholesterol chech up. Furthermore, 95.9% said no to stroke, 63.4% answered yes to fruits intake, 95.1% said yes to receiving health care, and 83.2% answered no to difficulty of walking.

Table 4

Simple logistic regression analysis results for each variables ***(n=253680)***

Variables		Heart Attack		Crude OR (95%CI)	p-value
		Yes	No		
Sex					
	Female	131769	10205	Reference	
	Male	98018	13688	1.803 (1.755, 1.852)	<0.001
Age					
	<45	53648	753	Reference	
	>= 45	176139	23140	0.107 (0.099, 0.115)	<0.001
Educational status	Never attended school	145	29	2.830 (1.898, 4.220)	.071
	Elementary	3265	778	3.372 (3.107,3.660)	<0.001
	Grades 9 through 11	7860	1618	2.913(2.747,3.089)	<0.001
	High school graduate	55283	7467	1.912(1.847,1.978)	<0.001
	Some college	62992	6918	1.554(1.501,1.609)	<0.001
	College graduate	100242	7083	reference	
Income					
	<15000$	17844	3750	3.304(3.169, 3.446)	<0.001
	15000-25000$	30782	5347	2.731 (2.633, 2.834)	<0.001
	25000-35000$	55546	6807	1.927 (1.863, 1.993)	<0.001
	>35000$	125615	7989	1	
BMI					
	<18.5 kg/m2	2796	331	0.891 (0.793, 1.000)	0.023
	18.5-24.9 kg/m2	79893	6206	0.584 (0.565,0.605)	<0.001
	25-29.9 kg/m2	82418	8758	0.799 (0.775, 0.825)	<0.001
	>30 kg/m2	64680	8598	Reference	
Smoking					
	No	132165	9092	Reference	
	Yes	97622	14801	0.454 (0.441, 0.466)	<0.001
High alcohol consumption	No	216379	23045	1.684(1.569,1.807)	<0.001
	Yes	13408	848	Reference	

Table 4 continued Variables		Heart Attack Yes	Attack No	Crude OR (95%CI)	p-value
High cholestrol					
	No	138949	7140	Reference	
	Yes	90838	16753	1.279 (.271,.287)	<0.001
Physical activity					
	No	53167	8593	1.866 (1.814, 1.919)	<0.001
	Yes	176620	15300	Reference	
Receiving any health care	No	11547	870	0.714(0.666, 0.766)	<0.001
	Yes	218240	23023	Reference	
Stroke					
	No	223432	19956	Reference	
	Yes	6355	3937	6.936 (6.649, 7.236)	<0.001
Fruit intake					
	No	83337	9445	1.149 (1.118, 1.181)	<0.001
	Yes	146450	14448	Reference	
Vegetable intake					
	No	42198	5641	1.374 (1.331, 1.418)	<0.001
	Yes	187589	18252	Reference	
Difficulty of walking	No	197027	13978	Reference	
	Yes	32760	9915	4.266 (4.147, 4.388)	<0.001

According to the findings of a logistic regression study, the variables that should be considered for inclusion in the final model at a significance level of $p<0.1$ are as follows: gender, age, educational status, income, body mass index; high alcohol consumption; high cholesterol; physical activity; receiving any health care; stroke; fruit and vegetable consumption; and difficulty walking. (Table 4).

The participants in the study who had a body mass index (BMI) of less than 18.5 kg/m^2 also had a 1.184 higher probability of having a heart attack than those who were obese [(AOR = 1.184, 95% CI: (1.042, 1.347); p-value = 0.001]; those who were obese had a 1.184 lower likelihood of having a heart attack. [(AOR =.902, 95% CI: (0.868, 0.937); p-value <0.001]

[(AOR =0.902, 95% CI: (0.868, 0.937)] [(AOR =.902, 95% CI: (0.868, 0.937)] The participants in the experiment who had a body mass index ranging from 18.5-24.9 kg/m² were 0.902 times less likely to have a heart attack than those in the research whose BMI was above 30 kg/m^2.This conclusion was statistically significant [(AOR = 0.944, 95% CI: (0.912, 0.978); p-value < 0.001]; the odds ratio was 0.944. Participants in the study who had a body mass index (BMI) between 25 and 24.9 kg/m^2 had a lower risk of having a heart attack by 0.944 compared to those who had a BMI of more than 30 kg/m^2 [(AOR =0.944, 95% CI: (0.912, 0.978);]. The participants in the trial who had a history of smoking had an increased risk of having a heart attack that was 1.52 times higher than the risk of the people in the study who did not smoke; those who did not smoke did not have this increased risk[AOR = 1.520, 95% CI: (1.475, 1.566); p-value <0.001] When compared to the heavy drinkers in the group, the individuals in the study who did not have a history of heavy drinking were shown to have a risk of having a heart attack that was 0.657 times lower than the heavy drinkers in the group[(AOR = 0.657, 95% CI: (0.610, 0.708); p-value <0.001]. Individuals in the study who had a history of having high cholesterol were at a greater risk of having a heart attack than those individuals who did not have a history of having high cholesterol[(AOR = 2.429, 95% CI: (2.355, 2.504) ; p-value <0.001]. This was the case regardless of whether or not they had high cholesterol in the past. Those who did not participate in any form of regular physical exercise had an adjusted odds ratio of 1.133, with a 95% confidence interval ranging from 1.097 to 1.171 [(AOR = 1.133, 95% CI: (1.097, 1.171) ; p-value <0.001] for having a heart attack, in comparison to those who did participate in regular physical activity. [(AOR = 0.722, 95% CI: (0.670.780) ; p-value <0.001]; persons who received some form of medical attention had a risk that was 0.650 times lower of having a heart attack compared to their counterparts.

Table 5:

Multivariate logistic regression results (n=253680)

Variables		Heart Attack		AOR(95%CI)	p-value
		Yes	No		
Sex	Female	131769	10205	Reference	
	Male	98018	13688	2.216 (2.150, 2.284)	<0.001
Age					
	<45	53648	753	Reference	
	>= 45	176139	23140	5.269 (4.889, 5.680)	<0.001
Educational status	Never attended school	145	29	1.396 (.902, 2.161)	<0.001
	Elementary	3265	778	1.318 (1.201, 1.447)	<0.001
	Grades 9 through 11	7860	1618	1.219 (1.138, 1.305)	<0.001
	High school graduate	55283	7467	1.107 (1.064, 1.152)	<0.001
	Some college	62992	6918	1.127 (1.085, 1.171)	<0.001
	College graduate	100242	7083	Reference	
Income					
	<15000$	17844	3750	1.859 (1.766, 1.957)	<0.001
	15000-25000$	30782	5347	1.830 (1.752, 1.912)	<0.001
	25000-35000$	55546	6807	1.507 (1.452, 1.565)	<0.001
	>35000$	125615	7989	Reference	
BMI					
	<18.5 kg/m^2	2796	331	1.184 (1.042, 1.347)	0.010
	18.5-24.9 kg/m^2	79893	6206	0.902 (0.868, 0.937)	<0.001
	25-29.9 kg/m^2	82418	8758	0944 (0.912, 0.978)	<0.001
	>30 kg/m^2	64680	8598	Reference	
Smoking					
	No	132165	9092	Reference	
	Yes	97622	14801	1.520 (1.475, 1.566)	<0.001
High alcohol consumption	No	216379	23045	0.657 (0.610, 0.708)	<0.001
	Yes	13408	848	Reference	
High cholestrol					
	No	138949	7140	2.429 (2.355, 2.504)	<0.001
	Yes	90838	16753	Reference	

Table 5 continued Variables		Heart Attack Yes	No	AOR (95%CI)	p-value
Physical activity					
	No	53167	8593	1.133 (1.097, 1.171)	<0.001
	Yes	176620	15300	Reference	
Receiving any health care					
	No	11547	870	0.722 (0.670,0.780)	<0.001
	Yes	218240	23023	Reference	
Stroke					
	No	223432	19956	Reference	
	Yes	6355	3937	3.622 (3.458, 3.794)	<0.001
Fruit intake					
	No	83337	9445	0.910 (0.883, 0.939)	<0.001
	Yes	146450	14448	Reference	
Vegetable intake					
	No	42198	5641	0.981 (0.946, 1.017)	0.302
	Yes	187589	18252	Reference	
Difficulty of walking					
	No	197027	13978	Reference	
	Yes	32760	9915	2.341 2.264 2.421	<0.001

As shown in table Table 5, sex [(AOR = 2.216, 95% CI: (2.150, 2.284)],age [(AOR = 6.295, 95% CI: 5.269 (4.889, 5.680)],educational status- elementary [(AOR = 1.31895% CI: (1.201, 1.305), some high school[(AOR = 1.10795% CI: (1.064, 1.152)], technical and vocational study [(AOR = 1.127,95% CI: (1.085, 1.171)], income<15000$[(AOR = 1.859, 95% CI: (1.766, 1.957)], 15000-25000$ [(AOR 1.830, 95% CI: (1.752, 1.912)], and 25000-35000$ [(AOR = 1.507, 95% CI: (1.452, 1.565), body mass index <18.5 Kg/m^2 [(AOR = 1.184, 95% CI: (1.042, 1.347)], 18.5-24.9 kg/m^2 [(AOR =0.902, 95% CI:(0.868, 0.937)], 25-29.9 kg/m^2 [(AOR = 0.944, 95% CI: (0.912, 0.978)],smoking [(AOR = 1.520, 95% CI: (1.475, 1.566)], no alcohol consumption [(AOR =0.657, 95% CI:(0.610, 0.708)], high cholesterol[(AOR = 2.429, 95% CI: (2.355, 2.504)], physical inactivity[(AOR = 1.133, 95% CI: (1.097, 1.171)], and receiving any health care [(AOR =.722, 95% CI: (0.670,0.780)],stroke [(AOR = 3.622, 95% CI:(3.458, 3.794)], fruit intake [(AOR = 0.910, 95% CI: (0.883, 0.939)], and difficulty of

walking [(AOR = 2.341, 95% CI: (2.264, 2.421)], were factors associated with heart attack history among study participants.

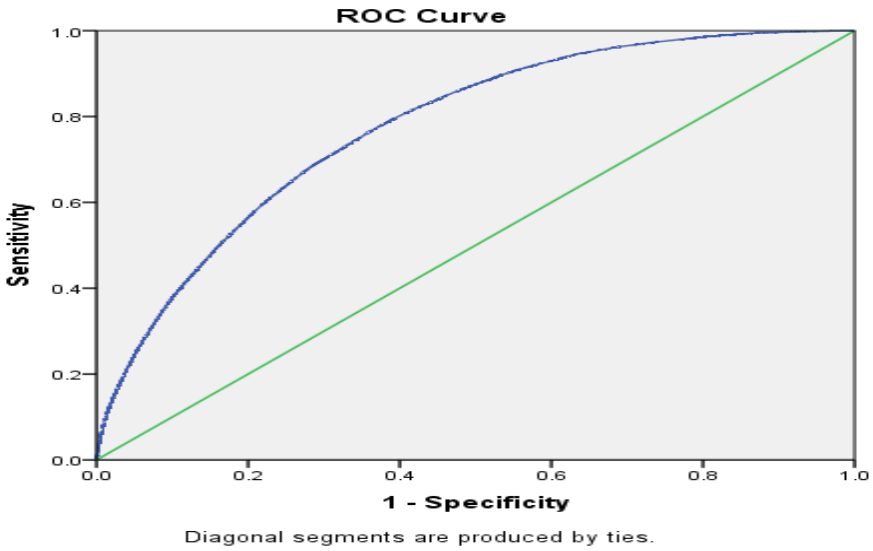
The findings of the research revealed that male participants in the study had a risk of having a heart attack that was 2.216 times greater than the chance of female participants having a heart attack [(AOR = 2.216, 95% CI: (2.150, 2.284); p-value <0.001]. This was in comparison to the likelihood of female participants having a heart attack. [(AOR = 5.269, 95% CI: (4.889, 5.680) ; p-value <0.001]. When compared to those who were the same age as their counterparts, those participants in the study who were older than 45 years old had a risk of having a heart attack that was 5.269 times higher than those who were the same age as their counterparts. [(AOR = 1.318 95% CI: (1.201, 1.305); p-value <0.001] People who had just completed their high school education had a chance of suffering a heart attack that was 1.318 times higher than people who had completed their college education. This finding was found in a study that looked at the relationship between education and heart attack risk. In addition, people who had finished less than two years of high school were 1.107 times more likely to have a heart attack than those who had finished four or more years of college [(AOR = 1.107 95% CI: (1.064, 1.152); p-value <0.001]; the 95% confidence interval for those who had finished four or more years of college ranged from 1.064 to 1.152. [AOR = 1.127, 95% CI: (1.085, 1.171); p-value <0.001]; nevertheless, those who had earned a college degree had a 1.171% lower risk of having a heart attack compared to those who had completed a vocationa and technical education program [(AOR = 1.859, 95% CI: (1.766, 1.957); p-value <0.001]; those who had completed an associate's degree program had. The participants in the study who indicated that their yearly income was less than $15,000 had a risk of having a heart attack that was determined to be 1.859% more than the risk that their peers had. persons who had an annual income that ranged from 15,000 to 25,000 dollars had a relative odds ratio (AOR) of 1.830 and a 95% confidence interval (CI) that varied from 1.752 to 1.912; the p-value for this comparison was <0.001. In a manner that is slightly unlike to the previous illustration, persons who had an annual income that ranged from 15,000 to 25,000 dollars had a relative odds ratio (AOR) of 1.830 [(AOR = 1.507, 95% CI: (1.452, 1.565); p-value <0.001]. Those persons whose annual income was between $25,000 and $35,000 had a 1.507% higher risk of having a heart attack when compared to those whose income was lower. persons whose income was lower than $25,000 had the lowest risk of having a heart attack.

Study participants who had a history of stroke were 3.622 times likely to have a heart attack than their counterparts [(AOR = 3.622, 95% CI:(3.458, 3.794)]. On the other hand, study participants who had a history of fruit intake were 0.910 times less likely to have a heart attack

than their comparison [(AOR =.910, 95% CI: (0.883, 0.939) ; p-value <0.001]. When compared to those people who did not have any difficulty walking at all, those people who had a history of having trouble walking had a chance of having a heart attack that was 2.341% higher[(AOR = 2.341, 95% CI: (2.264, 2.421) ; p-value < 0.001].

Roc curve analysis

Figure 3: Roc analysis curve



The ROC curve is a graphical representation that illustrates the performance of a binary classifier as the discrimination threshold is varied.The purpose of the ROC curve in logistic regression analysis is to assess and visualize the trade-off between the true positive rate (TPR) and the false positive rate (FPR) at various classification thresholds.The ROC curve allows for the calculation and comparison of the Area Under the Curve (AUC) values. AUC summarizes the overall performance of the logistic regression model by quantifying the area under the ROC curve. Models with higher AUC values indicate better discrimination between the two classes. The ROC curve is a valuable tool in logistic regression analysis as it provides a comprehensive evaluation of a model's performance, helps in selecting an appropriate classification threshold, facilitates model comparison, and enables the calculation and comparison of AUC values.

Area under roc curve (AUC) is 0.776 which calculated from multi variate regression model probabilities used for ROC (Figure 4). It has an AUC area =0.776. This shows the model is good and enough to predict the outcome.

CHAPTER V

Discussion

In this chapter, the explanation of these results is provided, and it is contrasted to the research that has been done in the past.In the cross-sectional study, both the frequency of heart attacks and the factors that placed individuals at increased risk for having one were analyzed with the purpose of identifying risk factors. It is estimated that 23,893 persons, which accounts for 9.4% of the population, will experience a heart attack at some point in their lives. Age, degree of education, excessive alcohol consumption, smoking, gender, smoking status, income, BMI, high cholesterol level, and PA are some of the most important characteristics that have been demonstrated to be connected with the condition. According to the findings of the study, a total of 23893 persons, which is equivalent to 9.4% of the population, have heart attacks each year in the general population. This research has a prevalence that is greater than that of earlier cross-sectional studies that have been done in the United States of America 5.4%; Yang et al., (2020) and in Saudi Arabia 2.4%; Alharbi SH, (2022), respectively. There is a potential that the variance might be attributed to the individuals who took part in the research. Additionally, there is a possibility that the variation can be attributed to differences in the sample size and the analytical procedures that were employed in the study.

There is a correlation between having had a heart attack in the past and characteristics such as gender, age, educational attainment (elementary, some high school, technical and vocational courses), and income (less than $15,000, between $15,000 and 25,000, between 25,000 and 35,000, and over 35,000). Gender and age are two of the most important factors in this correlation. This research lends credibility to a previous cross-sectional study that found a significant relationship between the warning signs of a heart attack and hypertension, unemployment, older age, male gender, lower education level, lack of regular exercise, single status, and unemployment (Han et al., (2019), and Fukuoka et al., (2022). The researchers who were responsible for carrying out this investigation were Han, C.H., 2019, Fukuoka, Y., and Oh, Y. It's possible that the similarities are due to the fact that researchers in both fields are pursuing comparable lines of inquiry.

TVanHooser et al. (2020) found that native Americans who had low composite knowledge scores for heart attack and stroke were more likely to be older, have lower levels of education, be poorer, be uninsured, reside in rural regions, be male, and not have a primary health care provider. In addition, native Americans who had low composite knowledge scores for heart attack and stroke were more likely to have no primary health care provider. In addition, they were less likely to have participated in recent physical activity. On the other hand, the findings of this inquiry do not agree with those that were found by Van Hooser et al. (2020). D. Jena et al., 2021). However, the study did not investigate whether or

not the participants had health insurance, where they lived, or access to a primary care physician. It's possible that the difference might be attributed to the size of the sample or the aspect that's being looked at. A sedentary lifestyle is directly associated to an increased probability of experiencing a cardiac attack, as the findings of the study came to the conclusion. This study's findings are consistent with those of an extra investigation that was carried out in China and found that a lack of physical activity has a positive link with cardiac issues (Qi, W et al., 2020). The findings of this study are comparable to those of the investigation that was carried out in China. According to the findings of another study, there is a correlation between not getting enough physical activity and having heart difficulties. It's likely that this is because individuals who live in the region where the research was carried out tend to have similarly busy lifestyles. If so, it would explain the findings. Comparing the socioeconomic status of various populations can also be done by looking at the different types of physical activities that individuals engage in. This is an additional factor that may be taken into consideration. [(AOR = 1.155, 95% CI: (1.020, 1.307)]; p-value < 0.001]individuals in the research who were obese but had a body mass index (BMI) of less than 18.5 kg/m2 had 1.155 times the risk of having a heart attack as those individuals who were underweight. Participants in the study who had a body mass index (BMI) in the range of 18.5-24.9 kg/m2 had an adjusted odds ratio (AOR) of 0.806, with a 95% confidence interval (CI) of 0.777 to.836 and a p-value of < 0.001. In addition to that, the development of type 2 diabetes was more frequent among this group. As a consequence of this, there was a substantial reduction in the probability of suffering a coronary attack. [(AOR = 0.857, 95% CI: (0.829, 0.886)]; p-value < 0.001]; persons who took part in the study and had a body mass index (BMI) between 25 and 24.9 kg/m² had a 0.806 lower risk of having a heart attack when compared to those who had a BMI of more than 30 kg/m²; this was a statistically significant finding. When compared to the risks faced by other people, having a body mass index of less than 18.5 kg/m² greatly increases the likelihood of having a heart attack. Other people may face less of these risks. There is a correlation between having a body mass index (BMI) between 18.5 and 24.9 kg/m² and between 25 and 29.9 kg/m²and having a decreased chance of having a heart attack. This is due to the fact that certain ranges are related with being of a healthy weight. Japanese researchers (Fukuoka, Y. and Oh, Y.J., 2022; Shiozawa, M et al., 2021; Tada, H et al., 2022) came to the same conclusion: there is an association between being underweight and having heart disease. There is a strong possibility that the people and the way of life are to blame for these parallels.

Smoking appears to be a significant risk factor for heart attack based on the adjusted odds ratio (AOR) of 1.624 and the 95% confidence interval (CI), which runs from 1.577 to 1.672. The findings of this examination are comparable to those discovered in a research project that was conducted in China (Yao H. et al., 2021).

It is possible for smoking to cause damage to the blood arteries, which may subsequently lead to the development of fatty deposits (also known as atherosclerosis). These deposits have the potential to obstruct blood flow to the heart.

There is a correlation between abstaining from alcohol use and a reduced chance of having a heart attack, as evidenced by an odds ratio (AOR) of 0.617 and a confidence interval (CI) that ranges from 0.573 to 0.664 for 95% of the time. According to the findings of this study, people who do not drink alcohol at all have a lower risk of getting a heart attack in contrast to people who consume alcohol on a daily basis. According to the findings of a second piece of research (Ronksley PE et al., 2011), the amount of alcohol consumption that was associated with the lowest risk of passing away as a result of coronary heart disease was between one and two drinks per day. According to the findings of another piece of research (Degerud E et al., 2018), drinking alcohol on a moderately regular basis (defined as drinking it between twice and three times per week) as opposed to drinking it less than thrice per month (defined as drinking it less than once every thirty days) was associated with a lower risk of cardiovascular disease (CVD). This was the case even though both groups consumed alcohol. This data adds credence to the generally held view that drinking an excessive amount of alcohol may have a deleterious influence on the health of one's cardiovascular system if the amount taken is high enough.

According to the adjusted odds ratio (AOR) of 2.614 and the 95% confidence interval (CI), which ranges from (2.537, 2.694), having a high cholesterol level is significantly related with an elevated risk of having a heart attack. This is the conclusion that can be drawn from the data. This finding lends credence to the theory that excessive cholesterol levels contribute to the progression of atherosclerosis, which is a theory that has gained widespread acceptance in recent years. Atherosclerosis is a disorder that causes the arteries to narrow and become more rigid, which can lead to an increased chance of having a heart attack. The findings of a study that was carried out in Dubai lend credence to the conclusion that has been presented here. According to the findings of the study, the incidence of high cholesterol as a risk factor has become significantly more common ($p = 0.041$). (Khan S., Ali S.A., 2017). According to the findings of a study that utilized an adjusted odds ratio (AOR) of 0.650 and a confidence interval (CI) that varied from (0.603 to 0.700), receiving any kind of medical treatment is associated with a lower risk of experiencing a heart attack. The purpose of the study was to determine whether or not there is a correlation between receiving medical care and the number of heart attacks that occur. This association was demonstrated to be valid despite the fact that the patients were treated using a variety of different approaches.According to the findings of this study, the chance of having a heart attack is lower for individuals who actively seek and get medical treatment, which may include regular checkups, preventative actions, and early detection of potential cardiovascular risk factors.

This research was supported by another finding that said having no health screening is highly connected with having a poor understanding of the warning signs of cardiovascular disease (Han, C.H., 2019). This research was conducted by Han. It's likely that the size of the population has anything to do with the striking similarities between the two groups.

CHAPTER VI

Conclusion and Recommendations

Conclusion

The adjusted odds ratio (AOR) for high cholesterol levels is 2.614, and the 95% confidence interval (CI) for this relationship is (2.537, 2.694). This indicates that high cholesterol levels are strongly related with an increased chance of having a heart attack. This backs with the widely accepted assumption that high cholesterol levels are a role in the progression of atherosclerosis. The illness known as atherosclerosis causes the arteries to become narrower and more rigid, which in turn raises the risk of having a heart attack. This finding is supported by study that was carried out in Dubai by Khan S. and Ali S.A. (2017), who discovered that increased cholesterol as a risk factor was significantly larger ($p = 0.041$). This result is supported by the research that was carried out in Dubai.

Receiving any form of medical care is associated with a lower chance of having a heart attack, according to research that used an adjusted odds ratio (AOR) of 0.650 and a confidence interval (CI) that ranged from (0.603 to 0.700. This was determined by comparing the risk of having a heart attack to the risk of receiving medical care. The researchers that carried out the study came to this realization as a result of their findings. According to the findings of this study, individuals who proactively seek out and receive medical treatment, which may include frequent examinations, preventative steps, and early identification of probable cardiovascular risk factors, have a lower likelihood of experiencing a coronary event such as a heart attack. This may be the case because individuals who actively seek out and receive medical treatment are more likely to catch potential risk factors for cardiovascular disease at an earlier stage. This conclusion was backed by an additional discovery that revealed that not having any sort of health screening is considerably connected with having a poor knowledge of the warning signals of cardiovascular disease (Han, C.H., 2019). This conclusion was supported by an additional discovery that suggested that not having any kind of health screening is strongly connected with having a poor understanding of the warning signals of cardiovascular disease. Keep in mind that the population size may play a role in the similarities that may be found between the two locations because it is likely that this is the case.

Recommendations

The majority of individuals across the world who are ill still suffer from cardiovascular diseases. The incidence of cardiovascular disease, usually referred to as CVD, has been steadily increasing over the course of the last several decades in practically all nations outside of the high-income world. It is anticipated that this pattern will carry on. Even more concerning is the fact that age-adjusted illness prevalence rates for cardiovascular conditions have started climbing in a number of places where they had been down earlier. This is an unsettling development. There is still a significant gap between recognizing cardiovascular sickness as a problem, establishing the most effective set of remedies, and applying those solutions throughout the majority of the community. This gap is due to the fact that there is still a significant difference between the two. This disparity can be attributed to the fact that there is still a substantial chasm between the two.

The Global Burden of Disease 2019 conference will continue to act as a reference that enables the monitoring and benchmarking of progress to achieve in the battle against cardiovascular disease. This will toke place in 2019 and should be held annually. In spite of this, additional money is still necessary in order to accomplish what has to be done in order to improve heart disease surveillance. The creation of accurate electronic health records, the building of solid vital registration systems, and the conduct of health surveys across all countries should be the primary focuses of these initiatives. There is an urgent need for extra research to be carried out in this specific sector due to the overall quantity of suffering that is caused by illness in the people of the world. In 2019, cardiovascular disease was responsible for 6.2 million fatalities, making it the top cause of death for adults between the ages of 30 and 70. The United States is one of few countries, where these fatalities have been properly documented. If the international community is going to achieve the targets for Sustainable Development Goal 3 and achieve at least a 30% reduction in premature death attributable to noncommunicable diseases by the year 2030, there is an immediate and compelling need to focus on the implementation of current cost-effective interventions and health policies.

This is essential if we are to achieve our goal of bringing the early death rate attributed to noncommunicable diseases down by at least 30 percent by the year 2030. To accomplish the aims of Sustainable Development Goal 3 and reduce the number of early deaths attributed to noncommunicable illnesses by at least 30 percent by the year 2030, the international community must do this. It is of the utmost importance that we continue to bring attention to global programs that aim to reduce the suffering and early death caused by cardiovascular disease (CVD). Despite the fact that there is presently a pandemic of viral illness around the globe, this is still the case. Because of how common cardiovascular diseases (CVD) are, the promotion of healthy and sustainable development is a struggle for every single nation on the face of the globe.

Health education initiatives to tackle the issue linked with excessive alcohol consumption, as well as the promotion of physical activities, should be submitted to the Ministry of Health.It is essential to put smoking-cessation strategies into action if we are going to be successful in addressing the problem at hand. Patients should undertake routine cholesterol testing at hospitals and other medical facilities so that the problem may be discovered in its early stages and proper therapy can be delivered. This will allow for the best chance of a positive outcome. Implementing a health education program that focuses on characteristics that increase the probability of having a heart attack is one way to find a solution to the problem. These factors include having a high body mass index and consuming alcohol on a frequent basis, to name just two examples.

Reference

Adams, B., Jacocks, L. and Guo, H., 2020. Higher BMI is linked to an increased risk of heart attacks in European adults: a Mendelian randomisation study. *BMC cardiovascular disorders*, *20*(1), pp.1-8.

Ahmed, A.A.A., Al-Shami, A.M., Jamshed, S., Zawiah, M., Elnaem, M.H. and Mohamed Ibrahim, M.I., 2020. Awareness of the risk factors for heart attack among the general public in Pahang, Malaysia: A cross-sectional study. *Risk management and healthcare policy*, pp.3089-3102.

Alharbi SH. Prevalence of stroke and myocardial infarction among patients with deteriorated GFR. Eur Rev Med Pharmacol Sci. 2022 Sep;26(17):6259-6264. doi: 10.26355/eurrev_202209_29649. PMID: 36111945.

Amin AM, Hamza M, Azmi S. Factors associated with the general public knowledge and awareness of cardiovascular diseases and its risk factors in Penang–Malaysia. ISOR Journal of Pharm. 2014;4(6):21–7

Andersen K, Mariosa D, Adami HO, et al. Dose response relationship of total and leisure time physical activity to risk of heart failure: a prospective cohort study. Circ Heart Fail 2014;7: 701–8Arch Intern Med 2001; 161: 996–1002.

Awad A, Al-Nafisi H. Public knowledge of cardiovascular disease and its risk factors in Kuwait: a cross-sectional survey. BMC Public Health. 2014;14(1):1131

Brinker SK, Pandey A, Ayers CR, et al. Association of cardiorespiratory fitness with left ventricular remodeling and diastolic function: the Cooper Center Longitudinal Study. J Am CollCardiol HF 2014;2:238–46

Britton, A.; Ben-Shlomo, Y.; Benzeval, M.; Kuh, D.; Bell, S. Life course trajectories of alcohol consumption in the United Kingdom using longitudinal data from nine cohort studies. BMC Med. 2015, 13, 47. [CrossRef] 22. Hwang, C.-L.; Piano, M.R.; Thur, L.A.; Peters, T.A.; da Silva, A.L.G.; Phillips, S.A. The effects of repeated binge drinking on arterial stiffness and urinary norepinephrine levels in young adults. J. Hypertens. 2020, 38, 111–117. [CrossRef] 23. Charakida, M.; Georgiopoulos, G.; Dangardt, F.; Chiesa, S.T.; Hughes, A.D.; Rapala, A.; Davey Smith, G.; Lawlor, D.; Finer, N.; Deanfield, J.E. Early vascular damage from smoking and alcohol in teenage years: The ALSPAC study. Eur. Heart J. 2019, 40, 345–353. [CrossRef]CDC. 2020. Weekly reports on cardiovascular disease. https://www.cdc.gov/mmwr/cme/conted_info.html#weekly.

Colbert LH, Visser M, Simonsick EM, et al. Physical activity, exercise, and inflammatory markers in older adults: findings from the Health, Aging and Body Composition Study. J Am GeriatrSoc 2004;52:1098–104.

Das K, Mondal GP, Dutta AK, Mukherjee B, Mukherjee BB. Awareness of warning symptoms and risk factors of stroke in the general population and in survivors stroke. J ClinNeurosci. 2007;14(1):12–6.

Degerud E, et al. 2018. Life course socioeconomic position, alcohol drinking patterns in midlife, and cardiovascular mortality: Analysis of Norwegian population-based health surveys. PLoS Med. 15(1):e1002476. doi: 10.1371/journal.pmed.1002476. PMID: 29293492; PMCID: PMC5749685.

Dhingra A, Garg A, Kaur S, et al. Epidemiology of heart failure with preserved ejection fraction. Curr Heart Fail Rep 2014;11:354–65ESC Cardiovascular Realities 2019 by-Flipsnack. Available online: https://www.flipsnack.com/Escardio/esccardiovascular

Fukuoka, Y. and Oh, Y.J., 2022. Perceived risk of heart attack and type 2 diabetes in Hispanic Adults with overweight and obesity. *Journal of Cardiovascular Nursing*, *37*(6), pp.E197-E205.

Goldwater, D.; Karlamangla, A.; Merkin, S.S.; Seeman, T. Compared to non-drinkers, individuals who drink alcohol have a more favorable multisystem physiologic risk score as measured by allostatic load. PLoS ONE 2019, 14, e0223168. [CrossRef] [PubMed]

Griswold, M.G.; Fullman, N.; Hawley, C.; Arian, N.; Zimsen, S.R.; Tymeson, H.D. Alcohol use and burden for 195 countries and territories, 1990–2016: A systematic analysis for the Global Burden of Disease Study 2016-ClinicalKey. Lancet 2018, 392, 1015–1035. Available online: https://www.clinicalkey.es/#!/content/playContent/1-s2.0-S0140673618313102?returnurl=https:%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0140673618313102%3Fshowall%3Dtrue&referrer=https: %2F%2Fwww.ncbi.nlm.nih.gov%2F (accessed on 22 October 2019). [CrossRef]

Han, C.H., Kim, H., Lee, S. and Chung, J.H., 2019. Knowledge and poor understanding factors of stroke and heart attack symptoms. *International journal of environmental research and public health*, *16*(19), p.3665.

He J, Ogden LG, Bazzano LA, et al. Risk factors for congestive heart failure in US men and women: NHANES I epidemiologic follow-up study. Arch Intern Med 2001;161:996–1002.

Intas G, Tsolakoglou J, Stergiannis P, Chalari E, Eleni C, Fildissis G. Do greek citizens have minimum knowledge about heart attack? A survey. J Health Sci. 2015;9(5):1–6

Irving BA, Davis CK, Brock DW, et al. Effect of exercise training intensity on abdominal visceral fat and body composition. Med Sci Sports Exerc 2008;40:1863–72.

J Am CollCardiol 2001; 37: 1677–1682. 6. He J, Ogden LG, Bazzano LA, Vupputuri S, Loria C, Whelton PK. Risk factors for congestive heart failure in US men and women: NHANES I epidemiologic follow-up study.

Jenča, D., Melenovský, V., Stehlik, J., Staněk, V., Kettner, J., Kautzner, J., Adámková, V. and Wohlfahrt, P., 2021. Heart failure after myocardial infarction: incidence and predictors. *ESC heart failure*, *8*(1), pp.222-237.

Kamimura D, Cain LR, Mentz RJ, White WB, Blaha MJ, DeFilippis AP, et al. Cigarette smoking and incident heart failure: Insights from the Jackson Heart Study. Circulation 2018;

Kenchaiah S, Evans JC, Levy D, et al. Obesity and the risk of heart failure. N Engl J Med 2002; 347:305–13.

Kenchaiah S, Sesso HD, Gaziano JM. Body mass index and vigorous physical activity and the risk of heart failure among men. Circulation 2009;119:44–52.

Khan, S., Ali, S.A. Exploratory study into awareness of heart disease and health care seeking behavior among Emirati women (UAE) - Cross sectional descriptive study. *BMC Women's Health* **17**, 88 (2017). https://doi.org/10.1186/s12905-017-0445-4

Kloner, R.A.; Rezkalla, S.H. To drink or not to drink? That is the question. Circulation 2007, 116, 1306–1317. [CrossRef]

Krokstad, S.; Ding, D.; Grunseit, A.C.; Sund, E.R.; Holmen, T.L.; Rangul, V.; Bauman, A. Multiple lifestyle behaviours and mortality, findings from a large population-based Norwegian cohort study-The HUNT Study. BMC Public Health 2017, 17, 58. [CrossRef] [PubMed]

Luan S, Yang Y, Huang Y, *et al*. Public knowledge of stroke and heart attack symptoms in China: a cross-sectional survey. *BMJ Open* 2021;11:e043220. doi:10.1136/ bmjopen-2020-043220

Makita, S.; Onoda, T.; Ohsawa, M.; Tanaka, F.; Segawa, T.; Takahashi, T.; Satoh, K.; Itai, K.; Tanno, K.; Sakata, K.; et al. Influence of mild-to-moderate alcohol consumption on cardiovascular diseases in men from the general population-ClinicalKey. Atherosclerosis 2012, 224, 222–227. Available online: https://www.clinicalkey.es/#!/content/playContent/1-s2.0-S0021915012004492?returnurl=https:%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0021915012004492%3Fshowall%3Dtrue&referrer=https: %2F%2Fwww.ncbi.nlm.nih.gov%2F (accessed on 13 November 2019).

Malaysia Dos. Statistics on causes of death, Malaysia 2018 [Available from: https://www.dosm.gov.my/v1/index.php?r=column/pdfPrev&id=aWg2VjJkZHhYcDdEM3JQSGloeTVlZz09

Marmot, M.; Brunner, E. Alcohol and cardiovascular disease. BMJ 1991, 303, 565. Available online: https://www.bmj.com/content/356/bmj.j1340.long (accessed on 6 November 2019). [CrossRef]

Massie BM, Carson PE, McMurray JJ, et al. I-Preserve Investigators. Irbesartan in patients with heart failure and preserved ejection fraction. N Engl J Med 2008;359:2456–67.

Millwood, I.Y.; Walters, R.G.; Mei, X.W.; Guo, Y.; Yang, L.; Bian, Z.; Bennett, D.A.; Chen, Y.; Dong, C.; Hu, R.; et al. Conventional and genetic evidence on alcohol and vascular disease aetiology: A prospective study of 500 000 men and women in China. Lancet 2019, 393, 1831–1842. [CrossRef]

Mostofsky, E.; Chahal, H.S.; Mukamal, K.J.; Rimm, E.B.; Mittleman, M.A. Alcohol and immediate risk of cardiovascular events. Circulation 2016, 133, 979–987. [CrossRef] [PubMed]

Mukamal, K.J.; Conigrave, K.M.; Mittleman, M.A.; Camargo, C.A.; Stampfer, M.J.; Willett, W.C.; Rimm, E.B. Roles of drinking pattern and type of alcohol consumed in coronary heart disease in men. N. Engl. J. Med. 2003, 348, 109–118. [CrossRef]

Mulia, N.; Karriker-Jaffe, K.J.; Witbrodt, J.; Bond, J.; Williams, E.; Zemore, S.E. Racial/ethnic differences in 30-year trajectories of heavy drinking in a

nationally representative U.S. sample. Drug Alcohol Depend. 2017, 170, 133–141. [CrossRef] [PubMed]

Nyberg M, Gliemann L, Hellsten Y. Vascular function in health, hypertension, and diabetes: effect of physical activity on skeletal muscle microcirculation. Scand J Med Sci Sports 2015;25Suppl 4:60–73.

O'Keefe, E.L.; DiNicolantonio, J.J.; O'Keefe, J.H.; Lavie, C.J. Alcohol and cv health: Jekyll and Hyde J-Curves. Prog. Cardiovasc. Dis. 2018, 61, 68–75. [CrossRef]

Puddey, I.B.; Mori, T.A.; Barden, A.E.; Beilin, L.J. Alcohol and hypertension—New insights and lingering controversies. Curr. Hypertens. Rep. 2019, 21, 79. [CrossRef

Qi, W., Ma, J., Guan, T., Zhao, D., Abu-Hanna, A., Schut, M., Chao, B., Wang, L. and Liu, Y., 2020. Risk factors for incident stroke and its subtypes in China: a prospective study. *Journal of the American Heart Association*, *9*(21), p.e016352.

Rehm, J.; Gmel, G.E.; Gmel, G.; Hasan, O.S.M.; Imtiaz, S.; Popova, S.; Probst, C.; Roerecke, M.; Room, R.; Samokhvalov, A.V.; et al. The relationship between different dimensions of alcohol use and the burden of disease—An update. Addiction 2017, 112, 968–1001. [CrossRef]

Rizk T, Blankstein R. Not All Heart Attacks are Created Equal: Thinking Differently About Acute Myocardial Infarction in the Young. Methodist DeBakeyCardiovasc J. 2021;17(4):60-67. doi: 10.14797/mdcvj.345

Roger VL, Go AS, Lloyd-Jones DM, et al., American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics—2012 update: a report from the American Heart Association. Circulation 2012; 125:e2–220

Ronksley PE, Brien SE, Turner BJ, Mukamal KJ, Ghali WA. 2011. Association of alcohol consumption with selected cardiovascular disease outcomes: a systematic review and meta-analysis. BMJ. 342:d671. doi: 10.1136/bmj.d671. PMID: 21343207; PMCID: PMC3043109.

Ronksley, P.E.; Brien, S.E.; Turner, B.J.; Mukamal, K.J.; Ghali, W.A. Association of alcohol consumption with selected cardiovascular disease outcomes: A systematic review and meta-analysis. BMJ 2011, 342, d671. [CrossRef] [PubMed]

Russell, M.; Fan, A.Z.; Freudenheim, J.L.; Dorn, J.; Trevisan, M. Lifetime drinking trajectories and nonfatal acute myocardial infarction. Alcohol. Clin. Exp. Res. 2019, 43, 2384–2394. [CrossRef] [PubMed]

Sattelmair J, Pertman J, Ding EL, et al. Dose response between physical activity and risk of coronary heart disease: a meta-analysis. Circulation 2011;124:789–

Shiozawa, M., Kaneko, H., Itoh, H., Morita, K., Okada, A., Matsuoka, S., Kiriyama, H., Kamon, T., Fujiu, K. and Michihata, N., 2021. Association of Body Mass Index with Ischemic and Hemorrhagic Stroke. Nutrients 2021, 13, 2343. *The Effect of Diet on Cardiovascular Disease, Heart Disease and Blood Vessels*, p.47.

Simoons ML, Serruys PW, van den Brand M, Res J, Verheugt FW, Krauss XH, et al. Early thrombolysis in acute myocardial infarction: limitation of infarct size and improved survival. J Am CollCardiol. 1986;7(4):717–28.

Suskin N, Sheth T, Negassa A, Yusuf S. Relationship of current and past smoking to mortality and morbidity in patients with left ventricular dysfunction. Tada, H.; Takamura, M.; Kawashiri, M.-a. 2022. The Effect of Diet on Cardiovascular Disease, Heart Disease, and Blood Vessels. Nutrients, 14, 246. https://doi.org/ 10.3390/nu14020246

Van Hooser, J.C., Rouse, K.L., Meyer, M.L., Siegler, A.M., Fruehauf, B.M., Ballance, E.H., Solberg, S.M., Dibble, M.J. and Lutfiyya, M.N., 2020. Knowledge of heart attack and stroke symptoms among US Native American Adults: A cross-sectional population-based study analyzing a multi-year BRFSS database. *BMC public health*, *20*, pp.1-10.

Virani SS, et al., American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee. Heart Disease and Stroke Statistics-2020 Update: A Report From the American Heart Association. Circulation. 2020 Mar 3;141(9):e139-e596. doi: 10.1161/CIR.0000000000000757. Epub 2020 Jan 29. PMID: 31992061.

WHO. Cardiovascular diseases (CVDs) 2018 [Available from: https://www. who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds).

WHO.2021. Cardiovascular disease fact sheet report. Available at https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds).

World Health Organization. Global Status Report on Alcohol and Health 2018; WHO: Geneva, Italy, 2018. Cheng, Y.-C.; Huang, Y.-C.; Huang, W.-L. Heart rate

variability as a potential biomarker for alcohol use disorders: A systematic review and meta-analysis. Drug Alcohol Depend. 2019, 204, 107502. [CrossRef]

World Health Organization. Tobacco trends. http://www.wpro. who.int/mediacentre/releases/2018/who_tobacco_trends.pdf (accessed March 15, 2019).

Yao, H., Zhang, J., Wang, Y. *et al.* (2021).Stroke risk and its association with quality of life: a cross-sectional study among Chinese urban adults. *Health Qual Life Outcomes* 19,236.https://doi.org/10.1186/s12955-021-01868-9.

Yusuf, S.; Hawken, S.; Ôunpuu, S.; Dans, T.; Avezum, A.; Lanas, F.; Mcqueen, M.; Budaj, A.; Pais, P.; Varigos, J.; et al. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. Lancet 2004, 364, 937–952. [CrossRef] 2015–2020 Dietary Guidelines for Americans; United States. Available online: https://health.gov/ dietaryguidelines/2015/resources/2015-2020_Dietary_Guidelines.pdf (accessed on 10 October 2019). Kalinowski, A.; Humphreys, K. Governmental standard drink definitions and low-risk alcohol consumption guidelines in 37 countries. Addiction 2016, 111, 1293–1298. [CrossRef

Appendices

Appendix A

CV

Name: Murphy A. Lowell
Date of birth: April 09, 1986
Place of birth: Liberia, Bong County
Cell numner: +231886514707
Email Adress: murphyalowell@gmail.com
Nationality : Liberian
Religion: Christianity

Education Background

2021—president: Student Institute of Graduate studies Near East University, Biostatistics Department Turkish Republic of North Cyprus.

2012—2013: Enrolled in the Cuttington University Graduate School studing epidiomology for two semisters however, did not graduate.

2005—2009 : enrolled and graduated from Cuttigton University undergraduate program in Bong County, Republic of Liberia. I earned a BSc Degree in Biology and Chemistry as major and minor respectively.

2002—2003: Enrolled and graduated from Konola Academy S.D.A Mission in Margibi County, Republic of Liberia. I obtained a High School Diploma and National Examination Certificate.

Work Experience

2018—2021: I worked as a class room instructor of the Ministry of Education Republic of Liberia. Assigned at Dolokelen GbovehMultilaterial high school as a senior high Biology Instructor. During this time, I prepared short, midden, and long term lesson plans for four(4) sessions to be presented during the class time scheduled. These responsibilities were usually challenging but, rewarding as well.

2017-2018: I was assigned as Vice principal of students Affairs at Dolokelen Gboveh high school, Ggarnga City, Bong County, Republic of Liberia. I was in charge of over 1500 students as this institution. I was responsible to plan daily, weekly of annual, activities relating to student affair throughout the school years under review. This was the most engaging administrative postions I served during my years as a school administer.

2015-2017: worked as a Biology and General science instructor as the St Martains catholic High school in Gbarnga City, Bong county,Republic of Liberia.I prepared daily lesson plan and presented to the students during class time.

2013—2015: I served as Biology instructor and vice principal for instruction at Konola Academy S.D.A Mission, MargibiCounty , Republic of Liberia. I was responsible to prepared lesson plan for three(3) classes and inspect other instructors lesson plan as part of my duties.

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AppendZ

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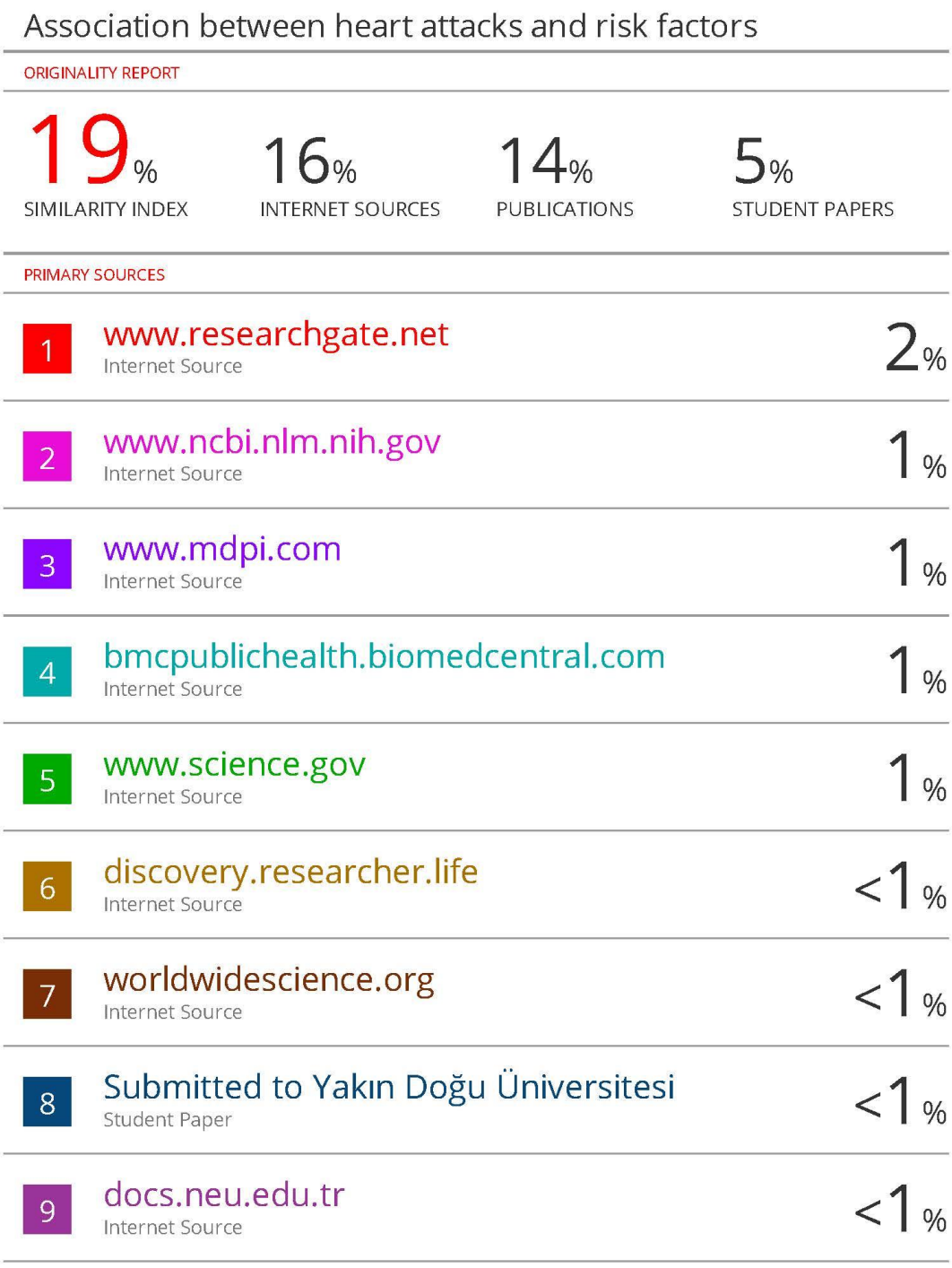

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