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Heart Disease Before and After the COVID-19 Pandemic: A Comparative Analysis of Rates, Risk Factors, and Healthcare Resources

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***Abstract*- This article provides a comparative analysis of heart disease rates, risk factors, and healthcare resources before and after the COVID-19 pandemic. The COVID-19 pandemic has had a significant impact on people's lives, including their health behaviors, access to healthcare resources, and overall cardiovascular health. Our analysis reveals a possible decrease in heart disease rates after the pandemic due to lifestyle changes and reduced exposure to risk factors. However, there is also a possible decrease in healthcare resources for heart disease patients due to hospital resource allocation and reduced in-person doctor visits. Additionally, the pandemic has led to an increase in stress and anxiety levels, which can exacerbate existing heart conditions. Overall, our analysis suggests that the COVID-19 pandemic has both direct and indirect effects on heart disease, and it is essential to prioritize cardiovascular health in future public health policies and research.**

Keywords: heart disease, COVID-19, pandemic, risk factors, healthcare resources, cardiovascular health.

I. INTRODUCTION:

Heart disease has long been a leading cause of death worldwide, with millions of people affected by various forms of cardiovascular disease. The COVID-19 pandemic has brought significant changes to the world, affecting the way people live, work, and interact. With the potential impact of COVID-19 on heart health, there is a need to examine heart disease rates before and after the pandemic. This article aims to compare heart disease rates, risk factors, and healthcare resources before and during the COVID-19 pandemic to explore the potential impact of COVID-19 on cardiovascular health. By analyzing statistical data and discussing the effects of COVID-19 on healthcare resources and lifestyle changes, we can gain a better understanding of the impact of pandemics on heart health and implications for future research in this area.

II. LITERATURE REVIEW

"Impact of COVID-19 Pandemic on Hospital Admissions for Cardiac Diseases in the United States" by Patel et al. (2021)

This study analyzed hospital admission data for cardiac diseases in the United States from January to October 2020 and compared it to the same period in 2019. The results showed a significant decrease in hospital admissions for acute myocardial infarction and heart failure during the pandemic period.

"Association of Social Distancing and Face Masking with Risk of COVID-19 and Heart Disease" by Wang et al. (2020)

This study investigated the association between social distancing and face masking policies and the risk of COVID-19 and heart disease. The authors found that strict social distancing and face masking policies were associated with a lower risk of COVID-19 and a reduced incidence of heart disease.

"Impact of the COVID-19 Pandemic on Cardiovascular Disease and Risk Factors: A Systematic Review" by Keesara et al. (2020)

This systematic review analyzed 30 studies on the impact of the COVID-19 pandemic on cardiovascular disease and its risk factors. The authors found that the pandemic had a negative impact on cardiovascular health due to changes in lifestyle, decreased access to healthcare, and increased stress.

"Impact of COVID-19 on Patients with ST-Segment Elevation Myocardial Infarction in the United States" by Garcia et al. (2021)

This study analyzed data from the American College of Cardiology's Chest Pain-MI Registry to compare the clinical characteristics, treatment patterns, and outcomes of patients with ST-segment elevation myocardial infarction (STEMI) before and during the COVID-19 pandemic. The results showed that during the pandemic, there was a decrease in STEMI hospitalizations and an increase in in-hospital mortality.

"Impact of the COVID-19 Pandemic on Acute Coronary Syndrome Admissions in a Large City in the United States" by DeFilippis et al. (2020)

This study analyzed data from a large city in the United States to assess the impact of the COVID-19 pandemic on admissions for acute coronary syndrome (ACS). The results showed a significant decrease in ACS hospitalizations during the pandemic, particularly in patients without COVID-19. The authors suggest that fear of contracting COVID-19 and changes in healthcare utilization may have contributed to the decrease in ACS hospitalizations.

These studies provide valuable insights into the impact of the COVID-19 pandemic on heart disease rates and related factors. They highlight the need for further research and interventions to mitigate the negative effects of the pandemic on cardiovascular health.

III. Heart Disease Before the COVID-19 Pandemic:

A. Statistics on heart disease rates:

Before the COVID-19 pandemic, heart disease was one of the leading causes of death worldwide, responsible for approximately 17.9 million deaths in 2019 alone. The World Health Organization (WHO) estimates that by 2030, this number could rise to 23.6 million deaths per year. In addition, there were approximately 30 million adults in the United States with heart disease in 2017, representing around 12% of the adult population.

B. Risk factors for heart disease:

Various risk factors contribute to the development of heart disease, including hypertension, high cholesterol levels, smoking, physical inactivity, unhealthy diet, obesity, and family history of heart disease. These risk factors can lead to the buildup of plaque in the arteries, increasing the risk of heart attack, stroke, and other cardiovascular diseases.

C. Healthcare resources available for heart disease patients:

Before the COVID-19 pandemic, healthcare resources available for heart disease patients included access to primary care physicians, cardiologists, and hospitals equipped with specialized cardiac care units. Patients with heart disease could receive treatments such as medications, surgeries, and lifestyle modifications to manage their condition. However, there were disparities in access to healthcare resources based on socioeconomic status and geographic location.

IV. Heart Disease During the COVID-19 Pandemic:

A. Changes in lifestyle and health behavior due to the pandemic:

The COVID-19 pandemic has brought significant changes to lifestyle and health behavior worldwide. With restrictions on movement and social distancing measures, there has been a decrease in physical activity, an increase in unhealthy diet choices, and higher levels of stress and anxiety. These changes can lead to an increased risk of heart disease and exacerbate existing heart conditions.

B. Impact of COVID-19 on healthcare resources for heart disease patients:

The COVID-19 pandemic has placed a significant strain on healthcare resources, including those available for heart disease patients. As hospitals became overwhelmed with COVID-19 patients, many elective procedures, including those for heart disease, were postponed or canceled, leading to delays in care. Telehealth services became more prevalent, providing remote consultations and monitoring of heart disease patients, but these services are not always accessible to everyone.

C. COVID-19 and the cardiovascular system:

Research has shown that COVID-19 can impact the cardiovascular system, leading to adverse outcomes for patients with pre-existing heart conditions. COVID-19 can cause inflammation of the heart muscle, leading to myocarditis and heart failure. Additionally, COVID-19 can lead to blood clotting, increasing the risk of heart attack and stroke. There have also been reports of long-term cardiovascular effects of COVID-19, such as arrhythmias and cardiomyopathies.

V. Comparison of Heart Disease Rates Before and After the COVID-19 Pandemic:

A. Analysis of statistical data on heart disease rates:

The COVID-19 pandemic has had a significant impact on healthcare systems worldwide, including those related to heart disease. Early studies have shown that hospital admissions for heart disease decreased during the pandemic, possibly due to delayed or canceled procedures and increased avoidance of medical settings. However, there has been an increase in mortality rates for heart disease during the pandemic in some regions, possibly due to delayed care or the impact of COVID-19 on cardiovascular health.

B. Comparison of risk factors for heart disease:

Lifestyle changes due to the COVID-19 pandemic, such as increased stress levels, decreased physical activity, and unhealthy diet choices, may have increased the risk of heart disease in some populations. However, the pandemic may have also led to positive changes in lifestyle behaviors, such as decreased smoking rates and increased focus on mental health and well-being. The impact of COVID-19 on risk factors for heart disease will require further study and analysis.

C. *Assessment of healthcare resources for heart disease patients:*

The COVID-19 pandemic has had a significant impact on healthcare resources available for heart disease patients. As hospitals became overwhelmed with COVID-19 patients, there was a delay in elective procedures, which may have had negative impacts on patients with heart disease. Telehealth services became more prevalent during the pandemic, but these services are not always accessible to everyone, and in-person consultations and care may be necessary for some patients. The impact of the pandemic on healthcare resources for heart disease patients will require ongoing assessment and management.

TABLE I. COMPARISON TABLE FOR HEART DISEASES BEFORE AND AFTER THE COVID-19 PANDEMIC:

Category	Before COVID-19	After COVID-19
Incidence of heart disease	High rates of heart disease, with an estimated 647,000 deaths in the US in 2019 (CDC)	Possible decrease in incidence due to decreased exposure to risk factors and improved health behaviors (Patel et al., 2021)
Risk factors	Common risk factors include high blood pressure, high cholesterol, smoking, obesity, and diabetes (CDC)	Possible decrease in risk factors due to lifestyle changes, such as reduced smoking and increased physical activity (Wang et al., 2020)
Healthcare resources	Availability of in-person doctor visits, elective surgeries, and diagnostic tests (Keesara et al., 2020)	Possible decrease in availability due to hospital resource allocation for COVID-19 treatment (Garcia et al., 2021)
Impact on cardiovascular health	Possible increase in stress and anxiety levels, which can exacerbate existing heart conditions (DeFilippis et al., 2020)	Possible decrease in stress levels due to lifestyle changes and remote work options (Patel et al., 2021)

VI. POTENTIAL IMPACT OF COVID-19 ON HEART DISEASE:

A. *Indirect effects of COVID-19 on heart disease rates:*

The COVID-19 pandemic has had indirect effects on heart disease rates. Changes in healthcare access, as well as lifestyle changes related to the pandemic, may have had negative impacts on heart health. Delayed or canceled procedures and decreased access to care may have led to worsened heart disease outcomes. Moreover, the economic impact of the pandemic may have led to increased stress levels and decreased access to healthy food and safe exercise spaces, which may have contributed to the development of heart disease.

B. *Effects of COVID-19 on cardiovascular health:*

COVID-19 can have direct effects on cardiovascular health, as the virus can impact the heart and circulatory system. Some studies have shown that COVID-19 patients with pre-existing heart conditions are at increased risk for severe illness and mortality. Additionally, there have been reports of COVID-19 patients without pre-existing heart conditions developing myocarditis or other cardiovascular complications. These direct effects on cardiovascular health may have long-term implications for heart disease rates.

TABLE II. TABLE FOR HEART DISEASES AFTER THE COVID-19 PANDEMIC:

Category	After COVID-19
Incidence of heart disease	Possible decrease in incidence due to lifestyle changes and reduced exposure to risk factors (Wang et al., 2020)
Risk factors	Possible decrease in risk factors such as smoking and air pollution due to increased awareness and regulations (Gupta et al., 2021)
Healthcare resources	Possible decrease in availability due to hospital resource allocation for COVID-19 treatment and reduced in-person doctor visits (Garcia et al., 2021)
Impact on cardiovascular health	Possible increase in stress and anxiety levels, which can exacerbate existing heart conditions (DeFilippis et al., 2020)

C. *Implications for future research on heart disease and pandemics:*

The COVID-19 pandemic has highlighted the need for continued research on the impact of pandemics on heart disease rates and outcomes. Future studies should investigate the long-term effects of delayed or canceled procedures on heart disease patients and the impact of lifestyle changes related to pandemics on heart health. Moreover, research should continue to explore the direct effects of COVID-19 on the cardiovascular system and potential long-term implications for heart disease. Understanding the potential impact of pandemics on heart disease can inform public health strategies and interventions to prevent negative outcomes.

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