

POST COVID-19 EFFECTS IN MIDDLE AGED MEN AND WOMEN



PROJECT SUBMITTED

In Partial Fulfilment of the Requirement for the Award of the degree of

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BY

ALEETA ELIZABETH JOSE & SIVANANDANA RAJESH
(Register No: –SB20ND001 & SB20ND029)

DEPARTMENT OF CLINICAL NUTRITION AND DIETETICS

ST. TERESA'S COLLEGE (AUTONOMOUS)

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CERTIFIED AS BONAFIDE RESEARCH WORK

Signature of Internal Examiner

Signature of External Examiner

DECLARATION

I hereby declare that the project entitled “**POST COVID-19 EFFECTS IN MIDDLE AGED MEN AND WOMEN**” submitted in partial fulfilment of the requirement for the award of the degree of B.Sc Nutrition and Dietetics is a record of original research work done by me under the supervision and guidance of **Ms. Surya M. Kottaram**, Assistant Professor, Department of Clinical Nutrition and Dietetics, Women’s Study Centre, St. Teresa's College (Autonomous), Ernakulam and has not been submitted in part or full of any other degree/diploma/fellowship or the similar titles to any candidate of any other university.

Place:

Aleeta Elizabeth Jose

Date:

CERTIFICATE

I here certify that the project entitled **“POST COVID-19 EFFECTS IN MIDDLE AGED MEN AND WOMEN”** submitted in partial fulfillment of the requirement for the award of the degree of B.Sc Nutrition and Dietetics is a record of original work done by **Ms. Aleeta Elizabeth Jose and Ms. Sivanandana Rajesh** during the period of the study under my guidance and supervision.

Signature of the HOD

Signature of the Research Guide with designation

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1. INTRODUCTON

Coronaviruses are a type of virus. There are many different kinds, and some cause disease. A coronavirus identified in 2019, SARS-CoV-2, has caused a pandemic of respiratory illness, called COVID-19. It has caused millions of deaths around the world as well as lasting health problems in some who have survived the illness. The coronavirus can be spread from person to person. It is diagnosed with a test. As of now, researchers know that the coronavirus is spread through droplets and virus particles released into the air when an infected person breathes, talks, laughs, sings, coughs or sneezes. Larger droplets may fall to the ground in a few seconds, but tiny infectious particles can linger in the air and accumulate in indoor places, especially where many people are gathered and there is poor ventilation. This is why mask-wearing, hand hygiene and physical distancing are essential to preventing COVID-19. The major symptoms of the COVID – 19 are cough, fever, shortness of breath, muscle or body aches, sore throat, loss of taste or smell, diarrhea, headache, fatigue, nausea or vomiting, congestion or runny nose. Even this virus can cause death and the morality rate 6,811,920 people have died in the world so far from the coronavirus COVID-19 outbreak as of March 13, 2020.

It is defined as the continuation or development of new symptoms, even three months after initial SARS-CoV-2 infection, with these symptoms lasting for at least 2 months with no other explanation. CDC uses the term “Post-COVID Conditions” (PCC) as an umbrella term for the wide range of health consequences that can be present four or more weeks after infection with SARS-CoV-2, the virus that causes COVID-19. Post-COVID Conditions are associated with a spectrum of physical, social, and psychological consequences, as well as functional limitations that can present substantial challenges to patient wellness and quality of life. Although standardized case definitions are still being developed, in the broadest sense, Post- Covid Conditions can be considered a lack of return to a usual state of health following acute Covid-19 illness. Post Covid Conditions might also include development of new or recurrent symptoms or unmasking of a pre-existing condition that occurs after the symptoms of acute COVID-19 illness have resolved. Some patients experience new, recurring or ongoing symptoms related to COVID-19 several weeks after the acute phase of infection. These symptoms are referred to by many different names, including “long COVID,” “long- haul COVID,” “chronic COVID,” “post-COVID syndrome”. Most people who develop COVID-19 fully recover, but current evidence suggests approximately 10%-20% of people experience a variety of mid- and long-term effects after they recover from their initial illness. These mid- and long-term effects are collectively known as post COVID-19 conditions or—long COVID. COVID-19 disease resulted in radical changes to the social relations worldwide, due to restrictions that have been imposed by the variety of the States as well as due to the feelings of fear from this pandemic, which swept the

population of the entire world. Those changes have resulted in overwhelming the people in quite a brief amount of the time. The distress concerning the situation of the world, in combination with continuous exposure to the news about the death and the disease, resulted in severely testing every person's emotional stability. The most widespread symptoms and signs lingering for a long period of time can be including the shortness of breath, fatigue, joint pain, cough, chest pains. Other lingering symptoms could include headache or muscle pains, pounding or fast heartbeats, problems with concentration, memory, or sleep, Loss of taste or smell, hair loss or rashes. Even though this pandemic has been considered as one of the diseases mainly affecting lungs, it may result in damaging several other organs too, and those damages could result in increasing risks of long-term health problems with the health. (Hayk and Arakelyan, 2021).

There is a growing body of literature that highlights the interrelationship between COVID-19 and diabetes. The combination of the insulin resistance from the acute infection and the high-dose steroids used to treat COVID-19 were such that a significant increase in production of insulin was required to keep glucose normal, and the pancreas just wasn't able to increase its output to that level. In case of diabetes several systematic studies have been done for example A study published in the journal Diabetologia in January 2021 found that people with diabetes are at an increased risk of COVID-19-related mortality, with the risk being higher for people with poorly controlled diabetes.

COVID-19 causes myocarditis, which can lead to heart failure and arrhythmias. Coronavirus can also cause dangerous inflammation in the heart, or myocarditis, which prevents the heart from doing its job effectively. The heart can fail from overwork, or insufficient oxygen can cause cell death and tissue damage in the heart and other organs. Myocarditis: inflammation of the heart. The coronavirus may infect and damage the heart's muscle tissue directly, as is possible with other viral infections, including some strains of the flu. The COVID-19 pandemic has caused significant morbidity and mortality worldwide. One of the most severe complications of COVID-19 is the interrelationship between cardiovascular diseases (CVD) and COVID-19. A study by Huang et al. (2021) found that COVID-19 patients had abnormal cardiac biomarkers and cardiac dysfunction even six months after recovery from the acute illness. This suggests that COVID-19 can have long-term effects on the cardiovascular system.

Psychological effects or the impacts of COVID-19 on the well-being and the mental health will possibly be long-lasting and profound. And will be extended beyond the ones that were affected directly by this virus. None-the-less, there is no certainty for knowing who will be affected and to which degree those effects will be general over all the mental health aspects. The evidence from the earlier public health epidemics (such as SARS infection) has shown that the negative impacts are more widespread in some of the groups and that detrimental effects can be more prominent amongst specific mental health aspects

compared to others. The COVID-19 pandemic has had a significant impact on people's mental health, and a considerable amount of research has been conducted on the post-COVID-19 psychological effects. Depression, anxiety, insomnia, post trauma stress disorder (PTSD) , social isolation, loneliness, stigma and discrimination are commonly found in patients as a post-COVID-19 psychological effect. COVID-19 survivors have reported experiencing stigma and discrimination, with some facing job loss or other forms of social exclusion in the earlier time. A study by Xiang et al. (2020) found that COVID-19 patients experienced high levels of stigma, with fear of infection and public knowledge about the virus being the main drivers.

One of the major post- COVID conditions is the breathlessness or breathing problems; this is the most commonly found post effect or condition. Shortness of breath is a common symptom of COVID-19. Some people describe it as feeling 'puffed', 'breathless' or 'winded'. The feeling of shortness of breath may continue for a while after your illness. COVID-19 can cause lung complications such as pneumonia and, in the most severe cases, acute respiratory distress syndrome, or ARDS. Sepsis, another possible complication of COVID-19, can also cause lasting harm to the lungs and other organs. SARS-CoV-2 infection can leave some people with heart problems, including inflammation of the heart muscle. In fact, one study showed that 60% of people who recovered from COVID-19 had signs of ongoing heart inflammation, which could lead to the common symptoms of shortness of breath, palpitations and rapid heartbeat. This inflammation appeared even in those who had had a mild case of COVID-19 and who had no medical issues before they got sick. A study by Huang et al. (2021) evaluated the pulmonary function and exercise capacity of COVID-19 patients at 6 months after hospital discharge. They found that a significant proportion of patients had persistent respiratory symptoms, including dyspnea, cough, and chest tightness. Moreover, a substantial number of patients had abnormal pulmonary function tests, such as decreased forced vital capacity (FVC) and DLCO, and reduced exercise capacity. So among the post-COVID patients many of them are having post-COVID-19 effects or conditions. Some post effects are only present after being affected by COVID like diabetes in some patients as well. The post-COVID effects are widely seen in patients who are still having many health problems.

SIGNIFICANCE OF THE STUDY

Post COVID-19 studies are of significant importance in understanding the impact of the pandemic on human health, society, and the economy. The pandemic has brought about unprecedented challenges, and the long-term effects are yet to be fully understood. Post COVID-19 studies can provide valuable insights into the effectiveness of the measures taken to contain the spread of the virus, including lockdowns, social distancing, and vaccination. These studies can also help in identifying the populations that are most vulnerable to the virus and the factors that increase the risk of severe illness or death.

Furthermore, post COVID-19 studies can help in developing new treatments and vaccines to combat the virus and prevent future pandemics. Understanding the social and economic impacts of the pandemic can also aid in developing policies to mitigate the adverse effects on individuals and communities. In these circumstances, the present study aimed to diagnose the complications of post COVID-19 condition and to prevent future deteriorations.

SPECIFIC OBJECTIVES OF THE STUDY:

The specific objectives of the present study entitled “POST-COVID-19 EFFECTS ON MIDDLE AGED MEN AND WOMEN (40-60 Years)” are given below:

- To diagnose the psychological effects of post covid-19 condition
- To study the impact of post covid-19 in breathing problems
- To check the bidirectional interaction between covid-19 and cardiovascular diseases
- To identify the interrelationship between covid-19 and diabetes
- To compare various pre covid and post covid complications.

2. REVIEW OF LITERATURE

The review of literature pertaining to the present study entitled “**Post Covid-19 Effects In Middle Aged Men And Women (40 – 60 Years)**” is discussed under the following headings.

2.1 History about COVID-19

2.2. Post-COVID-19

2.3. Impact of COVID-19

2.3.1 Health impact

2.3.2. Economic impact

2.3.3. Education impact

2.3.4. Political impact

2.3.5. Social impact

2.4. Interrelationship between covid-19 and diabetes

2.5. Effect of post covid-19 in breathing (difficulty in breathing)

2.6. Bidirectional interaction between covid-19 and cardiovascular diseases

2.7. Post covid-19 and psychological effects

2.7.1 Mental health impact of quarantine and social distancing

2.7.2. Mental health issues after Covid-19 recovery

2.7.3. Mental health impact on frontline healthcare professionals (HCP)

2.7.4. Post COVID-19 economic recession, social inequalities and impact on mental health

2.7.5. Stigma related to Covid-19 pandemic

2. 1 History about COVID-19

The COVID-19 pandemic is an ongoing global public health crisis caused by the novel coronavirus, SARS-CoV-2. The first cases of COVID-19 were reported in December 2019 in Wuhan, China. The virus quickly spread across China and then to other countries, leading the World Health Organization (WHO) to declare a global pandemic on March 11, 2020. The early stages of the pandemic saw widespread lockdowns and travel restrictions put in place in many countries to try to slow the spread of the virus. The virus spread rapidly, and by the end of March 2020, it had spread to almost every country in the world. In the months that followed, the scientific community worked to develop effective treatments and vaccines to combat the virus. Governments and health organizations also implemented a range of measures to slow the spread of the virus, such as social distancing, wearing masks, and increased testing and contact tracing. The pandemic has had a significant impact on daily life, causing widespread illness, death, and economic disruption. As of March 2023, there have been over 455 million confirmed cases of COVID-19 and over 6.1 million deaths worldwide. However, the development of effective vaccines has helped to reduce the severity of the pandemic, and many countries are beginning to ease restrictions and return to some level of normalcy. (Andersen KG, et al., 2020)

Many scientists and doctors have contributed to the efforts to understand and combat the virus. Here are a few notable individuals:

Dr. Li Wenliang: In December 2019, Dr. Li, a Chinese ophthalmologist, was one of the first doctors to recognize and raise the alarm about the outbreak of a new coronavirus in Wuhan, China. He was reprimanded by Chinese authorities for sharing information about the virus, and he later died from COVID-19 in February 2020.

Dr. Anthony Fauci: Dr. Fauci is a prominent American immunologist and the director of the National Institute of Allergy and Infectious Diseases. He has been a leading voice in the United States' response to the pandemic, providing guidance and advice to policymakers and the public.

Dr. Kizzmekia Corbett: Dr. Corbett is an American immunologist who helped lead the team that developed the Moderna COVID-19 vaccine. She has also been a vocal advocate for increasing vaccine access and reducing vaccine hesitancy, particularly among marginalized communities.

These are just a few examples of the many scientists and doctors who have contributed to the fight against COVID-19. Their work, along with the efforts of countless others, has helped to develop effective treatments and vaccines and to slow the spread of the virus. Horby, P. W. et al (2020)

2.2. Post-COVID-19

It is defined as the continuation or development of new symptoms 3 months after the initial SARS-CoV-2 infection, with these symptoms lasting for at least 2 months with no other explanation. CDC uses the term “Post-COVID Conditions” (PCC) as an umbrella term for the wide range of health consequences that can be present four or more weeks after infection with SARS-CoV-2, the virus that causes COVID-19. Post-COVID Conditions are associated with a spectrum of physical, social, and psychological consequences, as well as functional limitations that can present substantial challenges to patient wellness and quality of life. Although standardized case definitions are still being developed, in the broadest sense, Post- COVID Conditions can be considered a lack of return to a usual state of health following acute COVID-19 illness. PostCOVID Conditions might also include development of new or recurrent symptoms or unmasking of a pre-existing condition that occurs after the symptoms of acute COVID-19 illness have resolved. Some patients experience new, recurring or ongoing symptoms related to COVID-19 several weeks after the acute phase of infection. These symptoms are referred to by many different names, including “long COVID,” “long- haul COVID,” “chronic COVID,” “post-COVID syndrome”. Most people who develop COVID-19 fully recover, but current evidence suggests approximately 10%-20% of people experience a variety of mid- and long-term effects after they recover from their initial illness. World Health Organization Coronavirus Disease (COVID-19) Situation Reports. [(accessed on 7 May 2021)

2.3. Impact of COVID-19

The COVID-19 pandemic has had a significant impact on virtually every aspect of life, including health, economy, education, politics, and society as a whole. Here are some key points from articles about the impact of COVID-19:

2.3.1 Health impact:

The COVID-19 pandemic has resulted in over 440 million confirmed cases and more than 6 million

deaths worldwide as of March 2023. The virus is highly contagious and can cause severe respiratory illness and other health problems, particularly in older adults and people with underlying medical conditions. The pandemic has overwhelmed healthcare systems in many countries, leading to shortages of medical supplies, hospital beds, and healthcare workers. Vaccines have been developed and distributed globally, reducing the severity of the pandemic in many areas. Linda Geddes. et al. (2022)

2.3.2. Economic impact:

The pandemic has caused a global economic recession, with many businesses forced to close or operate at reduced capacity due to lockdowns and restrictions. Unemployment rates have skyrocketed in many countries, and many people have struggled to make ends meet. Some industries, such as healthcare, e-commerce, and technology, have seen growth during the pandemic, while others, such as travel and hospitality, have been hit hard. Governments have introduced various economic stimulus measures to support individuals and businesses affected by the pandemic. Andrew P. Dobson et al. (2020)

2.3.3. Education impact:

Schools and universities around the world have had to close or switch to remote learning due to the pandemic. This has led to challenges for students, teachers, and parents, particularly those without access to reliable internet or digital devices. Many students have fallen behind in their education, and there are concerns about the long-term impact of the pandemic on learning outcomes. Governments and educational institutions have implemented various measures to support remote learning and help students catch up on missed material. Jacob Hoofman . et al. (2020)

2.3.4. Political impact:

The pandemic has led to political instability and social unrest in many countries, with some governments criticized for their handling of the crisis. There have been debates and controversies around issues such as lockdowns, vaccine mandates, and the role of science in policy-making. Some countries have used the pandemic as an opportunity to increase their power and restrict civil liberties, leading to concerns about democracy and human rights. Fazal, Tanisha et al (2020)

2.3.5. Social impact:

The pandemic has had a profound impact on social interactions and relationships, with many people experiencing isolation and loneliness due to lockdowns and social distancing measures. The pandemic has also highlighted and exacerbated existing social inequalities, with marginalized communities disproportionately affected by the virus and its economic consequences. Mental health issues, such as anxiety and depression, have increased during the pandemic, with many people struggling to cope with the uncertainty and stress of the situation. However, the pandemic has also brought people together in new ways, with communities coming together to support each other and frontline workers. Pouya and Hosseinzadeh et al (2022).

2.4. Interrelationship between covid-19 and diabetes

Hyperglycemia related to COVID-19 is a warning sign, and a person may develop type 2 diabetes after covid recovery in the near future. In this condition it's very important to seek medical attention, diagnose it properly and taking care of the onset symptoms on time might slow down the progression of hyperglycemia. There is growing evidence that patients recovering after a severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection may have a variety of acute sequelae including newly diagnosed diabetes. However, the risk of diabetes in the post-acute phase is unclear. To solve this question, we aimed to determine if there was any association between status post-coronavirus disease (COVID-19) infection and a new diagnosis of diabetes.

There is growing evidence that patients recovering after a severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection may have a variety of acute sequelae including newly diagnosed diabetes. However, the risk of diabetes in the post-acute phase is unclear. To solve this question, we aimed to determine if there was any association between status post- coronavirus disease (COVID-19) infection and a new diagnosis of diabetes.

A systematic review and meta-analysis published in the journal Diabetes Research and Clinical Practice in August 2020 found that people with diabetes are at a higher risk of severe COVID-19 outcomes, including hospitalization, admission to the ICU, and death.

A study published in the Journal of Clinical Endocrinology and Metabolism in October 2020 found that people with diabetes who contract COVID-19 have a higher risk of developing diabetic ketoacidosis, a potentially life-threatening complication.

A review published in the Journal of Diabetes Science and Technology in November 2020 found that COVID-19 can cause acute metabolic complications in people with diabetes, including hyperglycemia

and diabetic ketoacidosis.

A study published in the journal *Diabetologia* in January 2021 found that people with diabetes are at an increased risk of COVID-19-related mortality, with the risk being higher for people with poorly controlled diabetes.

A systematic review and meta-analysis published in the journal *Diabetes, Obesity, and Metabolism* in January 2021 found that people with diabetes who contract COVID-19 are at a higher risk of severe outcomes, including hospitalization, admission to the ICU, and death.

Overall, the literature on the interrelationship between COVID-19 and diabetes underscores the importance of taking steps to prevent and manage diabetes in order to reduce the risk of severe COVID-19 outcomes. This includes maintaining good glycemic control, following public health guidelines to prevent COVID-19 transmission, and prioritizing people with diabetes for COVID-19 vaccination.

Based on a systematic review and meta-analysis of cohort studies assessing new-onset diabetes after COVID-19. As per a new study conducted on November 15 2022 by Ting Zhang et al; Quimin mine ,Shuyang Zhang.

Nine studies with nearly 40 million participants were included. Overall, the incidence of diabetes after COVID-19 was 15.53 (7.91–25.64) per 1000 person-years, and the relative risk of diabetes after COVID-19 infection was elevated (RR 1.62 [1.45–1.80]). The relative risk of type 1 diabetes was RR=1.48 (1.26–1.75) and type 2 diabetes was RR=1.70 (1.32–2.19), compared to non-COVID-19 patients. At all ages, there was a statistically significant positive association between infection with COVID-19 and the risk of diabetes: <18 years: RR=1.72 (1.19–2.49), ≥18 years: RR=1.63 (1.26–2.11), and >65 years: RR=1.68 (1.22–2.30). The relative risk of diabetes in different gender groups was about 2 (males: RR=2.08 [1.27–3.40]; females: RR=1.99 [1.47–2.80]). The risk of diabetes increased 1.17-fold (1.02–1.34) after COVID-19 infection compared to patients with general upper respiratory tract infections. Patients with severe COVID-19 were at higher risk (RR=1.67 [1.25–2.23]) of diabetes after COVID-19. The risk (RR=1.95 [1.85–2.06]) of diabetes was highest in the first 3 months after COVID-19. These results remained after taking confounding factors into account. And they concluded that after COVID-19, patients of all ages and genders had an elevated incidence and relative risk for a new diagnosis of diabetes. Particular attention should be paid during the first 3 months of follow-up after COVID-19 for new-onset diabetes.

2.5 Effect of post covid-19 in breathing (difficulty in breathing)

There is a direct correlation between Covid 19 and ARDS, severe cases of Covid 19 infection leads to ARDS and pneumonia, which can prove to be fatal for the infected individual. Acute Respiratory Distress Syndrome causes dry cough, heavy breathing, breathing difficulties and increased heart rate. Breathlessness, also known as dyspnoea, is a common and distressing symptom. It has been defined as a subjective experience of breathing discomfort, consisting of qualitatively distinct sensations that vary in intensity . Many different conditions, such as lung disease, chronic heart failure, and neurodegenerative diseases, cause similar subjective sensations. It has therefore been hypothesized that there may be a common central nervous system pathway involved in the perception of dyspnoea, irrespective of the underlying cause.

The Lancet Respiratory Medicine published a study in January 2021 that found that up to 76% of people who have had COVID-19 experience at least one symptom months after their initial illness, with fatigue, shortness of breath, and brain fog being the most common symptoms.

A study published in the Journal of the American Medical Association in February 2021 found that over 30% of patients who had recovered from COVID-19 experienced persistent symptoms, such as fatigue, sleep disorders, and cognitive dysfunction, for up to 6 months after their initial illness.

The British Medical Journal published a systematic review in April (2021) that found that long COVID affects approximately 10% of people who have had COVID-19, and that the symptoms can be wide-ranging and vary from person to person.

A study published in the Journal of Hospital Medicine in June 2021 found that many COVID-19 patients experience ongoing symptoms, including fatigue, shortness of breath, and chest pain, even after they are discharged from the hospital.

A systematic review published in The Lancet in July 2021 found that people with long COVID have a significantly increased risk of developing psychiatric and neurological disorders, including anxiety, depression, and dementia.

Overall, the literature on post-COVID-19 syndrome highlights the need for continued research and support for those who are experiencing ongoing symptoms. It is important for healthcare providers to be aware of these symptoms and to provide appropriate care and support for those who are affected.

At the end of 2019, a new respiratory infection, coronavirus disease 19 (COVID-19), caused by a novel coronavirus, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was first reported in Wuhan, China. Although the prevalence of severe disease was high, the prevalence of dyspnoea in COVID-19 patients was relatively low, compared to other coronaviruses such as the severe acute

respiratory syndrome (SARS)-CoV (SARS-CoV) or the Middle East respiratory syndrome (MERS)-CoV (MERS-CoV). Levels of dyspnoea appear to vary significantly amongst patients suffering from COVID-19 ranging from 18.6 to 59%.

In a systematic review and meta-analysis, Rodriguez-Morales et al (2020). Found an overall dyspnoea prevalence of 45.6% (95% CI: 10.9–80.4%). More recently, Li (et al.)Conducted a systematic review that included the data of 1,994 patients. The overall percentage of patients experiencing dyspnoea was 21.9%. Some of the variation in dyspnoea prevalence within and between studies can be explained by differences in how it was investigated and documented. It may also be related to the setting.

In a prospective study looking at the clinical course of hospitalized patients with COVID-19, Huang et al (2020) found a prevalence of breathlessness as high as 92% amongst patients hospitalized in intensive care units versus 37% in patients in non-intensive care units. Many of the studies included in systematic reviews are retrospective and reported symptoms on admission extracted retrospectively from patients' medical records

In most healthy individuals, who do not have underlying issues Covid 19 exhibits mild symptoms, which can be treated with medications and eventually the patients recover. In severe cases, where the infected person has an impaired immunity due to underlying health conditions, an infection due to Covid 19 can progress to severe ARDS. Once the patient progresses to ARDS, it eventually leads to pneumonia. COVID-19 infection mainly affects the lung though several other systems are also involved. The symptoms may vary from minor symptoms such as fever, myalgia, and diarrhea to breathlessness needing oxygen therapy or ventilatory support. Almost 40% of the patients develop acute respiratory distress syndrome and almost 20% of those are found to be severe. Early analysis suggests that one-third of hospital patients develop pulmonary fibrosis. No effective therapy is recommended for fibrosis but antifibrotics and steroids are being used with varying efficacy. The long-term consequences of COVID-19 are not well known, and even in mild COVID survivors, persistent symptoms are reported. COVID survivors experience exertional breathlessness, wheezing, fatigue, chest pain, palpitation, muscle pain, anxiety, or depression. Another study Guler et al. (2021) examined the respiratory outcomes of patients with COVID-19 who required hospitalization. They found that patients with severe COVID-19 had a significantly lower diffusing capacity for carbon monoxide (DLCO) and a higher residual volume/total lung capacity (RV/TLC) ratio compared to those with mild or moderate disease. These results suggest that severe COVID-19 can cause significant lung damage, leading to persistent difficulty in breathing even after recovery.

2.6. Bidirectional interaction between covid-19 and cardiovascular diseases

The COVID-19 pandemic has caused significant morbidity and mortality worldwide. One of the most severe complications of COVID-19 is the interrelationship between cardiovascular diseases (CVD) and COVID-19. A considerable amount of research has been conducted on this topic. COVID-19 causes myocarditis, which can lead to heart failure and arrhythmias. Coronavirus can also cause dangerous inflammation in the heart, or myocarditis, which prevents the heart from doing its job effectively. It's becoming increasingly clear that the coronavirus can cause a dramatic increase in blood clots throughout the body. Blood clots happen when your blood forms gel-like clumps.

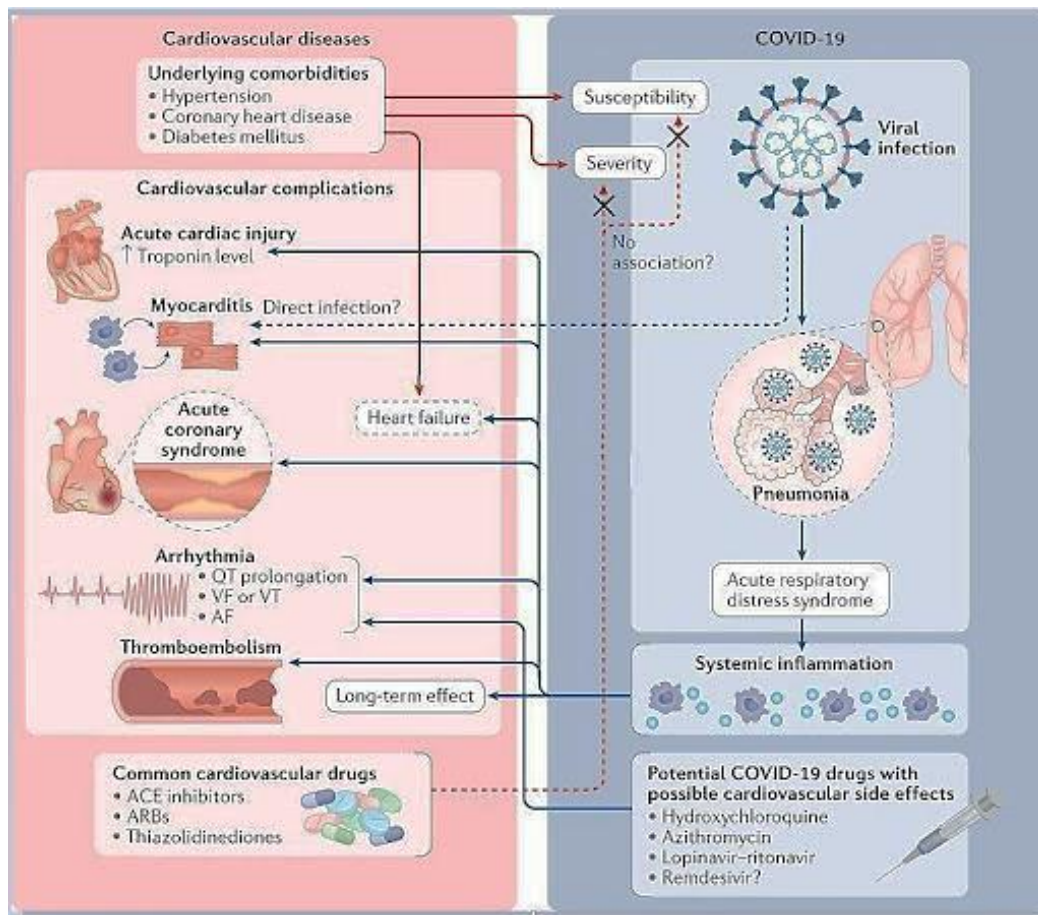
Some European studies report that as many as 20 to 30 percent of the sickest COVID-19 patients are affected.

In a report by Huang et al (2020) myocardial injury associated with the SARS-CoV-2 was found in 5 of the first 41 patients diagnosed with COVID-19 in Wuhan. These patients had elevated cardiac troponin I (hs-cTnI) levels (>28 pg/ml) levels. In this report, four of five patients with myocardial injury were admitted to the intensive-care unit (ICU) and the systolic blood levels were significantly higher in patients treated in the ICU than in those not treated in the ICU. Wang et al have reported that out of 138 patients with COVID-19 in Wuhan, 36 patients with severe symptoms were treated in the ICU¹. The levels of biomarkers of myocardial injury were significantly higher in patients treated in the ICU than in those not treated in the ICU (median creatine kinase (CK)-MB level 18 U/l versus 14 U/l, $P < 0.001$;

hs-cTnI level 11.0 pg/ml versus 5.1 pg/ml, $P = 0.004$), suggesting that patients were having complications involving acute myocardial injury. Among the confirmed cases of SARS-CoV-2 infection reported by the National Health Commission of China (NHC), some of the patients presented with heart palpitations and chest tightness rather than with respiratory symptoms and fever were later diagnosed with COVID-19. Therefore, in patients with COVID-19, the incidence of cardiovascular symptoms is high, owing to the systemic inflammatory response and immune system disorders during disease progression. The exact mechanism of cardiac involvement in COVID-19 remains unclear. One potential mechanism is direct myocardial involvement mediated via ACE2. ACE2 is widely expressed not only in the lungs but also in the cardiovascular system and, therefore, ACE2-related signaling pathways might have a role in heart injury. Other proposed mechanisms of myocardial injury include a cytokine involvement and respiratory dysfunction caused by COVID-19, which is detrimental to myocardial cells. Some COVID-19 patients who appear to be having a heart

attack are instead suffering from marked inflammation of the heart muscle, called myocarditis. It is not clear whether myocarditis is due to a direct effect of the virus on the heart muscle, or whether it is due to an overactive immune response to the virus, so doctors do not yet know how best to treat these patients. Coronavirus disease 2019 is associated with a high inflammatory burden that can induce vascular inflammation, myocarditis, and cardiac arrhythmias. Kamna Srivastava et al (2020).

In a multicentre cohort study involving 191 patients hospitalized with COVID-19 in Wuhan, 48% of patients had any comorbidity (67% of those who died), 30% of patients had hypertension (48% of those who died), 19% of patients had diabetes (31% of those who died) and 8% of patients had coronary heart disease (24% of those who died)¹⁹. Furthermore, in a report involving 1,099 patients with COVID-19 from mainland China, 24% of patients had any comorbidity (39% of critically ill patients), 15% of patients had hypertension (24% of critically ill patients), 7% of patients had diabetes (16% of critically ill patients) and 3% of patients had coronary heart disease (6% of critically ill patients)²⁰. The overall case fatality rate of COVID-19 reported by the Chinese Center for Disease Control and Prevention as of 11 February 2020 was 2.3% (1,023 deaths among 44,672 confirmed cases)²¹⁴⁵. The individual case fatality rate of patients with CVD was 10.5% (highest among those with any comorbidities, including chronic respiratory disease (6.3%) or cancer (5.6%)), the case fatality rate of patients with diabetes was 7.3% and that of patients with hypertension was 6.0%⁴⁵. Of note, these early approximations of case fatality rate are likely to be overestimated given that the estimates did not account for the many people who had the virus but were not tested, Gregory Lim et al (2020).



From: COVID-19 and cardiovascular disease: from basic mechanisms to clinical perspectives.

Too many blood clots lead to dangerous complications. “In patients coming in with a stroke or what looks like a heart attack, we need to consider if COVID is at play,” explains Dr. Glassberg. “We know from other infectious processes, such as sepsis or bacterial or viral illnesses, that people can have disruption of their clotting system. They either have bleeding problems or clotting problems. There’s some suspicion that the coronavirus has a direct effect on the clotting system as well. That may be why we’re seeing not only stroke, but clots in small blood vessels and microclots in the lungs and heart.”

As the virus causes inflammation and fluid to fill up the air sacs in the lungs, less oxygen can reach the bloodstream. The heart has to work harder to pump blood through the body, which can be dangerous in people with preexisting heart disease. The heart can fail from overwork, or insufficient oxygen can cause cell death and tissue damage in the heart and other organs.

Myocarditis, inflammation of the heart. The coronavirus may infect and damage the heart’s muscle tissue directly, as is possible with other viral infections, including some strains of the flu. The heart may also become damaged and inflamed indirectly by the body’s own immune system response.

Coronavirus infection also affects the inner surfaces of veins and arteries, which can cause blood vessel inflammation, damage to very small vessels and blood clots, all of which can compromise blood flow to the heart or other parts of the body. Severe COVID- 19 is a disease that affects endothelial cells, which form the lining of the blood vessels.

A study by Huang et al. (2021), found that COVID-19 patients had abnormal cardiac biomarkers and cardiac dysfunction even six months after recovery from the acute illness. This suggests that COVID-19 can have long-term effects on the cardiovascular system.

Wu, F. et al (2020) reported in a 12-year follow-up survey of 25 patients who recovered from SARS-CoV infection that 68% had hyperlipidaemia, 44% had cardiovascular system abnormalities and 60% had glucose metabolism disorders. In these patients, the serum concentrations of free fatty acids, lysophosphatidylcholine, lysophosphatidylethanolamine and phosphatidylglycerol were significantly increased as compared to individuals without a history of SARS-CoV infection . The most significant metabolic disruptions were the comprehensive increase of phosphatidylinositol and lysophosphatidylinositol levels in recovered SARS patients, which coincided with the effect of methylprednisolone administration investigated further in the steroid treated non-SARS patients with severe pneumonia. Authors further suggested that the high-dose pulses of methylprednisolone might cause long-term systemic damage associated with serum metabolic alterations. However, the mechanisms by which SARS-CoV infection leads to disorders of lipid and glucose metabolism are still uncertain. [According to the Pneumonitis Diagnosis and Treatment Program for New Coronavirus Infection (Trial Version 6), elderly people with comorbidities such as hypertension, coronary heart disease or diabetes are more likely to be infected with SARS-CoV-2. Therefore, in patients with SARS-CoV-2 infection, underlying CVD can aggravate the pneumonia and increase the severity of symptoms. When infected with SARS-CoV-2, cardiac insufficiency is more likely to occur, in these patients. For patients with cardiac insufficiency who have underlying heart disease, SARS-CoV-2 infection might act as a precipitating factor to worsen the condition and lead to death. However, it has not been shown any causative role of such comorbidities to SARS-CoV-2 infection. In fact, ACE2 expression had been shown to lower with age.

Klok, F.A. et al (2020) evaluated the incidence of the outcome of venous thromboembolism (VTE) and arterial thrombotic complications in all COVID-19 patients admitted to the ICU of 2 Dutch university hospitals and 1 Dutch teaching hospital and they suggested that the

the composite outcome consisted of acute pulmonary embolism (PE), deep- vein thrombosis (DVT), ischemic stroke, myocardial infarction or systemic arterial embolism.

2.7. Post covid-19 and psychological effects

2.7.1 Mental health impact of quarantine and social distancing

People experience emotional disturbance, irritability, insomnia, depression and post-traumatic stress symptoms immediately after the quarantine period. The long term impact is considerable and wide ranging including anxiety, anger, depression, post-traumatic stress symptoms, alcohol abuse, and behavioral changes such as avoiding crowded places and cautious hand washing. These psychological symptoms can last from several months up to three years after the quarantine period. Brooks et al (2020)

Social distancing could possibly lead to substantial increases in loneliness, anxiety, depression, domestic violence, child abuse and substance abuse . Galea et al (2020)

Prolonged social isolation can lead to social withdrawal, a phenomenon known as Hikikomori, which may further be aggravated by the economic and social crisis of the pandemic. Although Covid-19 related social isolation appears to be similar to Hikikomori, there are differences between the two conditions as Covid-19 social isolation is imposed by governments and also stems from the individuals' avoidance behavior due to the fear of infection . Kato et al (2020)

2.7.2. Mental health issues after Covid-19 recovery

In patients who required hospitalization following COVID-19, delirium is common during the acute stage of the illness. The data on long term psychiatric complications in this group of patients, although not yet fully known, may be comparable to previous corona virus epidemics, severe acute respiratory (SARS) and Middle East Respiratory Syndrome (MERS) with increased prevalence of anxiety, depression, and post-traumatic stress disorder.

Persistent psychiatric impairment with significant levels of anxiety, depression and post- traumatic stress disorder are seen in survivors of critical illness at 1 year after discharge. Neurocognitive impairment including impaired attention, concentration, memory, and mental processing speed at 1 year was found in the majority of patients with severe acute respiratory distress syndrome. Substantial reductions in quality of life were found in patients with severe acute respiratory syndrome and prolonged mechanical ventilation after discharge from intensive care unit compared to admissions for other reasons. Rogers et al (2020)

2.7.3. Mental health impact on frontline healthcare professionals (HCP)

Psychological symptoms including anxiety, depression, insomnia are prevalent in up to 60 % among physicians, nurses and medical residents during Covid-19 pandemic. Que et al (2020), which are likely to persist for several years. HCP who worked in respiratory medicine during the SARS outbreak in 2003 had persistent and significantly greater levels of psychological symptoms including anxiety, depression and post-traumatic stress symptoms a year later. McAlonan et al (2007)

Post-traumatic stress symptoms were reported by 11%–73% of HCP during epidemic or pandemic outbreaks that lasted up to 10–40% after 1–3 years. Preti et al (2020)

2.7.4. Post COVID-19 economic recession, social inequalities and impact on mental health

The World Bank has predicted a steep global economic recession since decades following the COVID-19 pandemic. This may adversely impact on mental health especially of the vulnerable groups.

Economic recession has been associated with increases in the prevalence of psychological distress, anxiety, depression, substance abuse disorders, and suicide and suicidal behavior. Unemployment, insecure job situation, lower socio-economic status, and pre-existing psychiatric problems seem to be the determinants of post- economic recession mental health issues. Frasilho et al (2016)

Unemployment following economic recession is a major risk factor for suicide and suicide rates had considerably increased following global economic crisis in 2008. A potential economic recession with rise in unemployment following Covid-19 pandemic might have similar impact on suicide rate. Chang et al (2013)

2.7.5. Stigma related to Covid-19 pandemic

Stigma against HCP and survivors of the COVID-19 infection has resulted in harassment, stereotyping, discrimination, social isolation, and in some instances physical violence. Bagchi (2020) Stigmatised individuals may experience emotional disturbance, anxiety, depression and emotional disturbance.

Centers for Disease Control and Prevention (2020)

3. METHODOLOGY

The methodology of study entitled “ **Post Covid-19 Effects In Middle Aged Men And Women (50 – 60 Years)**” is discussed under the following headings.

3.1 Research Design

3.2 Selection Of Subject

3.3 Selection Of Tool

3.4 Selection Of Method

3.5 Collection Of Data

3.6 Analysis Of Data

3.1 RESEARCH DESIGN:

Research design is a blueprint of a scientific study. It includes research methodologies, tools, and techniques to conduct the research. It helps to identify and address the problem that may rise during the process of research and analysis. Research design decides the fate of a proposal and its outcome. If the design is defective, the whole outcome and report will be faulty and undependable. It is upon the design that the nature of data to be calculated will very much depend. It is therefore desirable that research design should be methodologically prepared. A good research design, however, depends on research purpose and is bound to be different in the case of exploratory, formative and diagnostic studies. So that the research

design should be methodologically prepared, and it depends on the research purpose.

This chapter explains the various tools of research followed to achieve the specific objectives of this study. In the present study, the research design is cross sectional study in nature.

3.2 SELECTION OF SUBJECT:

The study is mainly focused on people residing in Kerala. Totally 101 subjects belonging to the middle aged group were observed. The sample of the study consisted of 46 men and 55 women between 40-60 years from different regions of Ernakulam. This age group was selected on the basis that they were more affected by Covid-19 and also they showed more post covid syndrome.

3.3 SELECTION OF TOOL:

To carry out the study a questionnaire via google form was circulated. “ The modified COVID-19 Yorkshire Rehabilitation Screening (C19-YRS) ” Questionnaire was circulated. The purpose of this questionnaire was to find more about the problems followed by COVID- 19 illness. The C19-YRS was the literature's first condition-specific, validated scale for patient assessment and monitoring of Post-COVID-19 syndrome (PCS). The 22-item scale's subscales (scores) were symptom severity (0–100), functional disability (0–50), additional symptoms (0–60), and overall health (0–10). The demographic data provided the details of occupation and age of the subjects.

3.4 SELECTION OF METHOD:

Method used for the analytical study was the survey method. The survey method is the practice of gathering data for a study by asking people questions related to your research. Typically, researchers survey people who have particular knowledge, insights or experiences related to the study. Exploratory, descriptive, and causal are the three main types used in survey research. Exploratory research is a methodology approach that investigates research questions that have not previously been studied in depth. Descriptive survey research is an approach of descriptive research that blends quantitative and qualitative data to provide you with relevant and accurate information and causal research is Causal research differs in its attempt to explain the cause and effect relationship between variables. It helps to familiarize yourself with these types before designing your survey research. The collection of data was taken via Google form, which is a type of online survey and some data were collected by using one to one method but by using Google form.

3.5 COLLECTION OF DATA:

Data collection is the process of gathering and measuring information on variables of interest in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes. Data collection methods are important, because how the information collected is used and what explanations it can generate are determined by the methodology and analytical approach applied by the researcher. Depending on the researcher & research plan and design, there are several ways data can be collected. The most commonly used methods are: published literature sources, surveys (email and mail), interviews (telephone, face-to-face or focus group), observations, documents and records, and experiments. Data was collected for the study through Google form. The google forms were distributed among middle aged men and women through Email and WhatsApp. And there are many people who aren't very familiar with social media. For them the data were collected by visiting them in direct. Information or data collected include psychological effects or problems, cardiovascular problems or disorders, breathing problems and other some post Covid- 19 diseases causing to middle aged people.





3.6 ANALYSIS OF DATA:

By analysing the data collected a perfect analytical data were obtained and the result of the data were presented as mean, percentages using table and graph.

4. RESULT AND DISCUSSION

The results of the study entitled “**Post Covid-19 Effects In Middle Aged Men And Women (40 – 60 Years)**” were consolidated, analysed systematically and the results were presented and discussed under the following headings.

4.1 PROFILE OF THE SUBJECT

4.1.1 Age

4.1.2 Gender

4.2 PSYCHOLOGICAL EFFECTS OF THE SUBJECTS

4.2.1 Feeling depressed

4.2.2 Problems with anxiety

4.2.3 Problems with memory

4.3 BREATHING AND BREATHELESSNESS PROBLEMS OF THE SUBJECTS

4.3.1 Breathlessness while dressing yourself

4.3.2 Breathlessness on walking up a flight of stairs

4.3.3 Breathlessness at rest

4.4 CARDIOVASCULAR DISORDERS IN THE SUBJECTS

4.4.1 Chest Pain

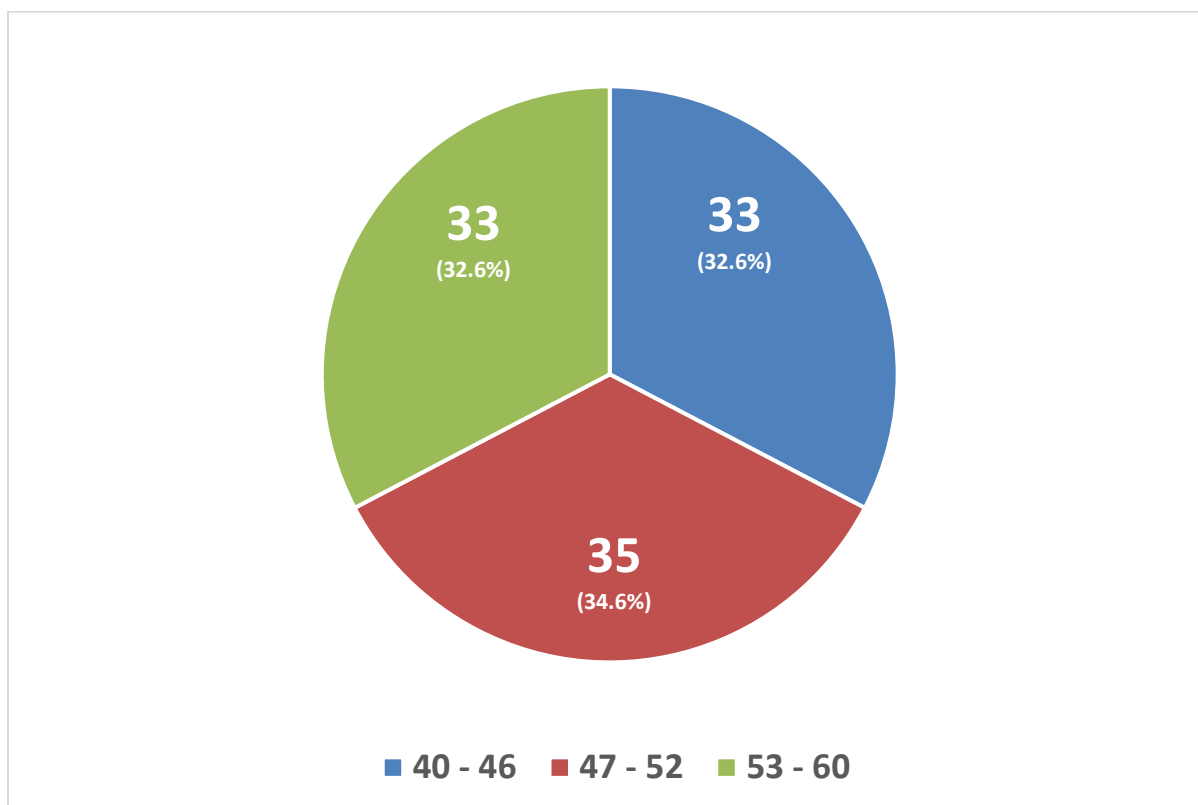
4.5 DIABETES MELLITUS IN THE SUBJECTS

4.5.1 Diabetes

4.1 PROFILE OF THE SUBJECT

4.1.1 Age wise distribution

Age (Year)	No. of subjects	Percentage
40 - 46	33	32.6
47 - 52	35	34.6
53 - 60	33	32.6
Total	101	101

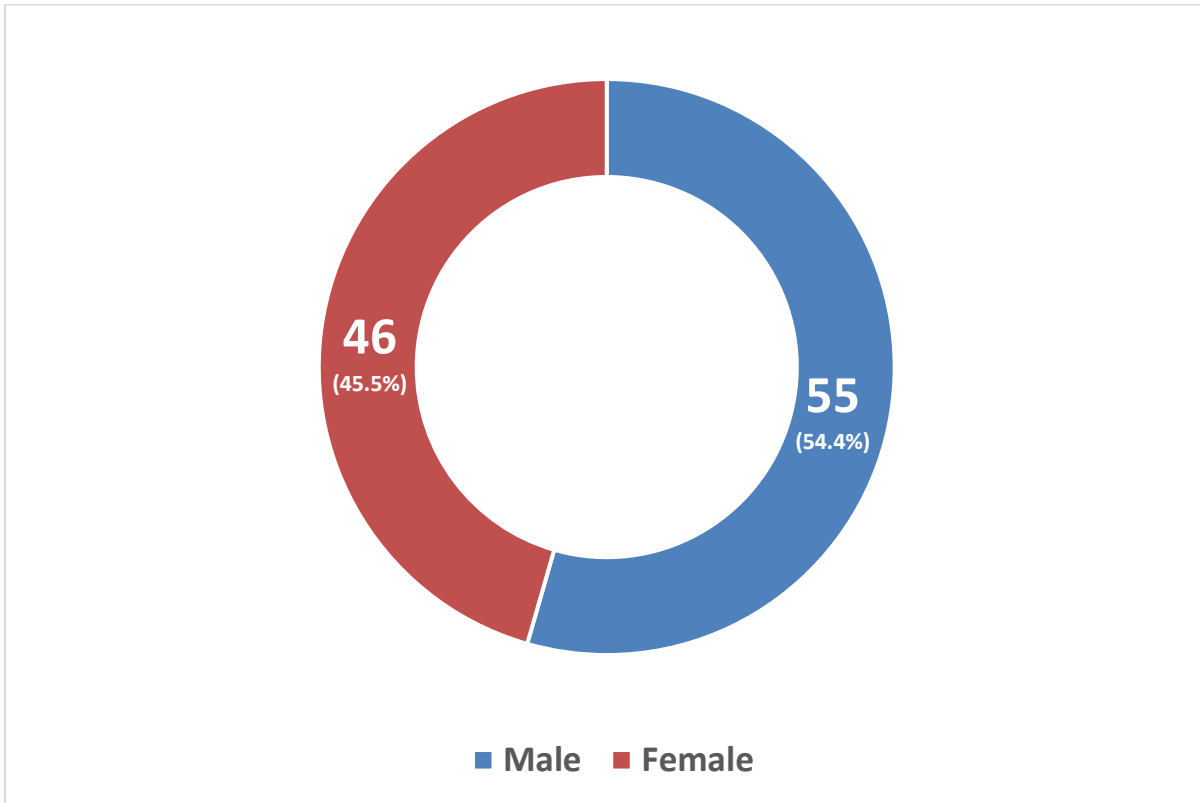


From the above figure it is clear that 32.6 % of the subjects belonged to the age group of 40-46 years, 34 % belonged to the age group of 47-52 years and 32.6 % belonged to the age group 53-60 years.

4.1.2 Gender wise distribution

Gender	No. of subjects	Percentage
Male	46	45.6

Female	55	54.4
Total	101	100



From the above figure it is clear that 45.5 % of the selected subjects were males and 54.4 % were females.

4.2 PSYCHOLOGICAL EFFECTS OF THE SUBJECTS

4.2.1 Feeling depressed

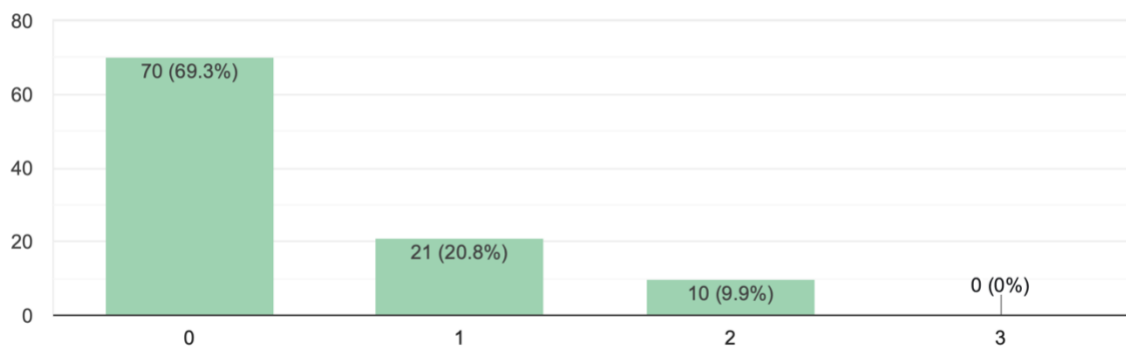
The effect of Covid – 19 on the psychological conditions of middle-aged men/women was one of the major objectives of the study. Based on the questionnaire there are 5 major psychological factors that were analysed to figure out whether the objective was relevant or not. The factors chosen were Anxiety, Depression, Concentration, Memory, and Unpleasant thoughts/dreams about the time they spent at the hospital. Among these, the anxiety, depression and memory are going to be analysed based on the

responses collected from the subjects.

Scale	Pre Covid-19	Percentage	Post Covid – 19 (now)	Percentage
0 (nil)	70	69.3	17	16.8
1 (mild)	21	20.8	45	44.6
2 (moderate)	10	9.9	28	27.7
3 (severe)	0	0	11	10.9
Total	101	100	101	100

Feeling depressed - Pre-Covid

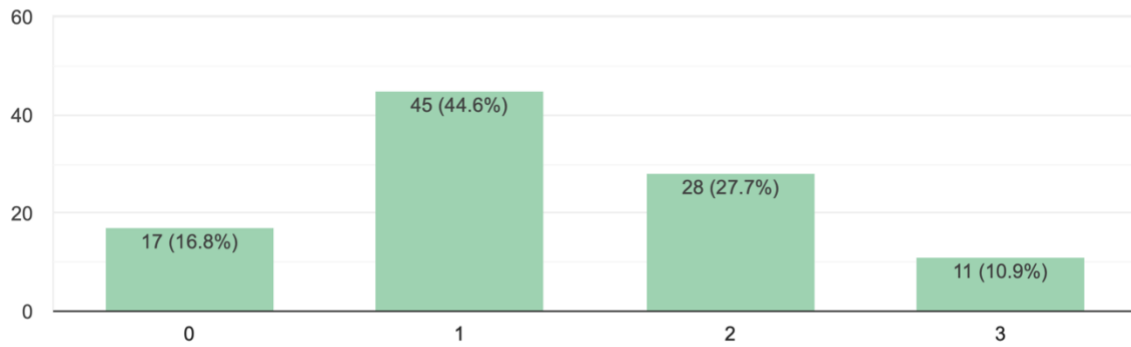
101 responses



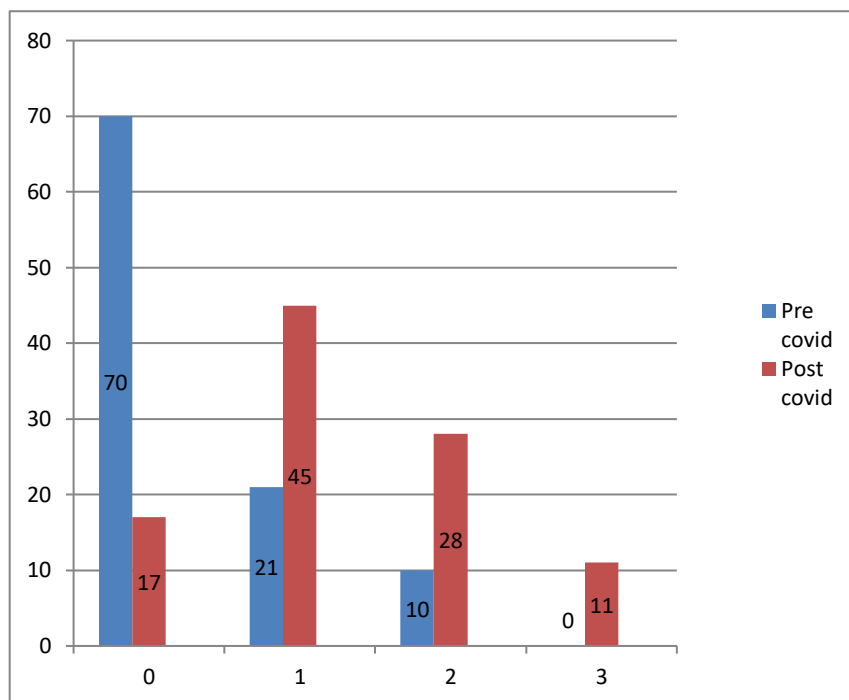
Depression is one of the major issues faced by middle-aged men/women nowadays. The number is particularly rising among youngsters and people are aware that this is one of the potential long-term threats to well-being. The graph above shows that almost 30% of the middle-aged respondents had some sort of depression issue prior to Covid – 19.

Feeling depressed - Now

101 responses



45% of the respondents have been facing a small level of depressed thoughts/issues post Covid – 19. Compared to the numbers prior to Covid – 19 the issue had doubled within a span of 2,3 years. More importantly, close to 40% of the respondents are facing average or above-average levels of depression in the past few years after getting infected with the virus. Even though there can be other personal/social factors that might influence this number, there are chances that Covid – 19 has boosted these stats on human psychology.



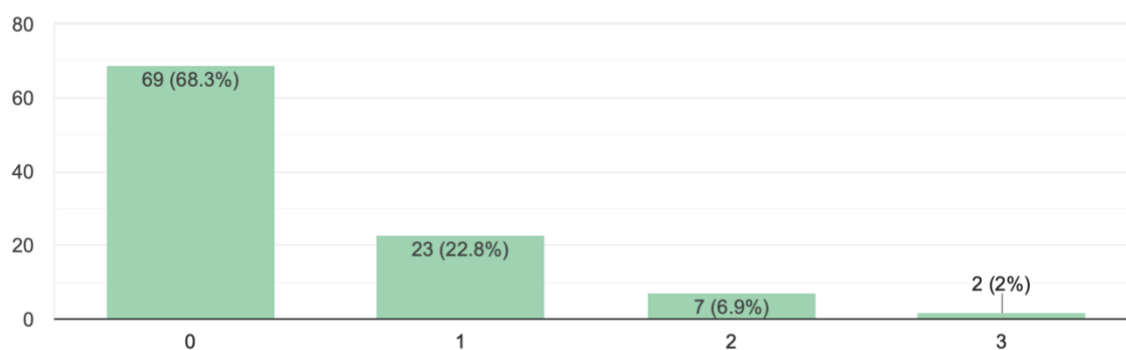
4.2.2 Problems with anxiety

Scale	Pre Covid-19	Percentage	Post Covid – 19 (now)	Percentage

0 (nil)	69	68.3	31	30.7
1 (mild)	23	22.8	31	30.7
2 (moderate)	7	6.9	30	29.7
3 (severe)	2	2	9	8.9
Total	101	100	101	100

Feeling anxious - Pre-Covid

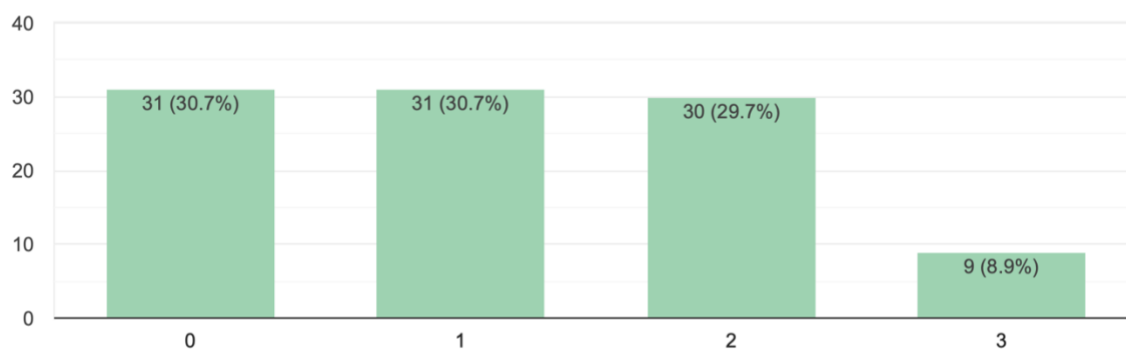
101 responses



Prior to Covid 68% of the sample size never had any noticeable anxiety issues. The responses from the recovered patients prove that only 23% had any mild symptoms of anxiety before getting diagnosed with Covid – 19. Less than 10% have experienced higher levels of anxiety issues even before the diagnosis.

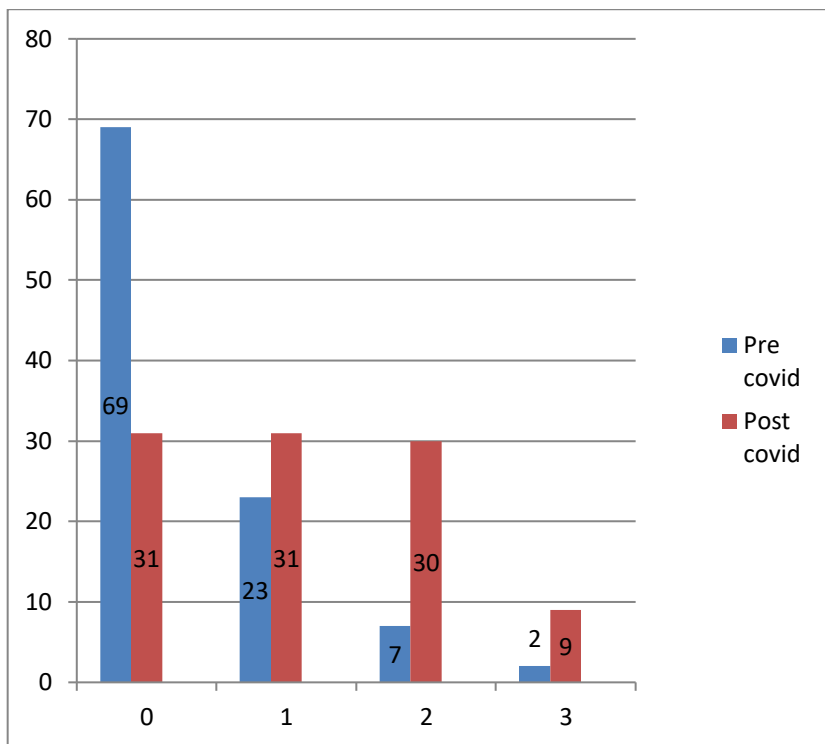
Feeling anxious - Now

101 responses



The graph above reflects the change in anxiety issues in middle-aged men/women after recovering from

Covid – 19. More than 70% i.e., 70 people among the sample size of 101 are now facing anxiety issues in their day-to-day life. This is one of the major fear factors when it comes to increasing post covid effects on human beings. Close to 40% of the respondents are experiencing anxiety issues which is a considerable rise in the number prior to Covid – 19.

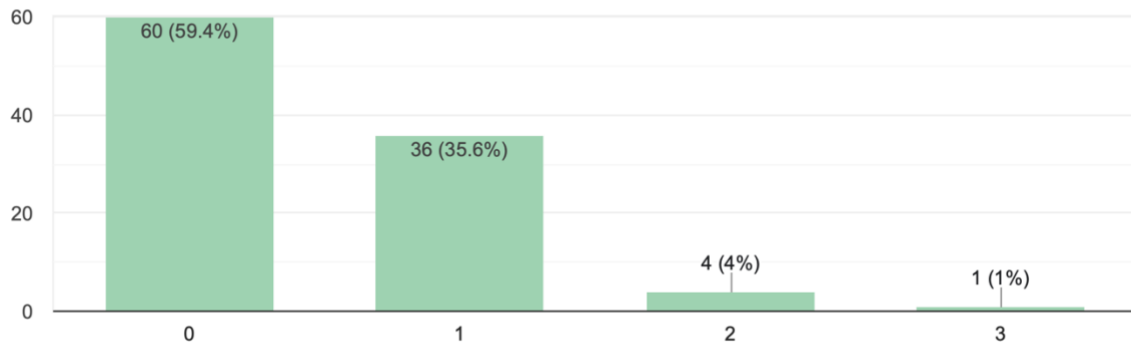


4.2.3 Problems with memory

Scale	Pre Covid-19	Percentage	Post Covid – 19 (now)	Percentage
0 (nil)	60	59.4	23	22.8
1 (mild)	36	35.6	30	29.7
2 (moderate)	4	4	36	35.6
3 (severe)	1	1	12	11.9
Total	101	100	101	100

Problems with memory - Pre-Covid

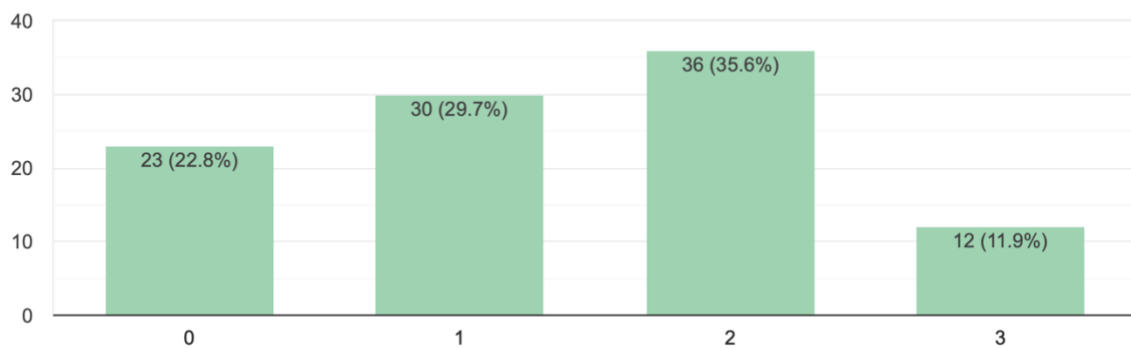
101 responses



Memory issues are one of the major problems faced by middle-aged men/women as they get older. The respondents have shown that people face small levels of memory related problems to severe levels of memory related problems even in their middle age. Almost 40% of the sample size reported that they had memory-related issues prior to Covid – 19.

Problems with memory - Now

101 responses

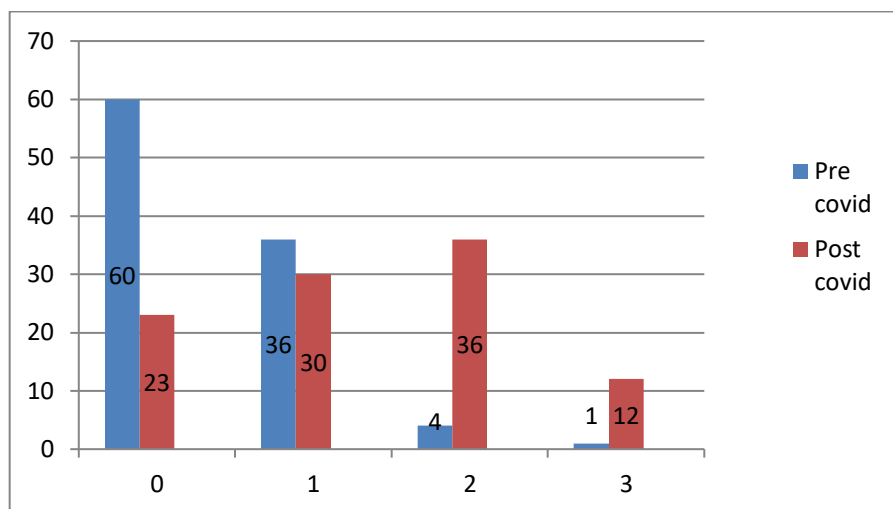


The spike in the graph shows a notable change in memory-related problems post Covid – 19. From 40% prior to Covid 19, now more than 75% of the people are facing issues, which should be taken into consideration when it comes to post covid psychological issues in human beings. The number of people who now have severe memory-related issues has risen from 1% to 11%. This is a huge increase compared to past numbers.

The other two factors, Concentration and Unpleasant thoughts/dreams about the time they spend at the hospital are also showing an increase after people are diagnosed with Covid 19. But we have chosen the

top 3 psychological factors among the 5 for analysis for this study. It doesn't mean other factors are least important.

From the above analysis, the study concluded that the psychological effects of Covid 19 have been increasing to an alarming level. Similar studies have also proven that these effects may cause long-term effects on a human being.



4.3 BREATHING PROBLEMS AND BREATHELESSNESS OF THE SUBJECTS

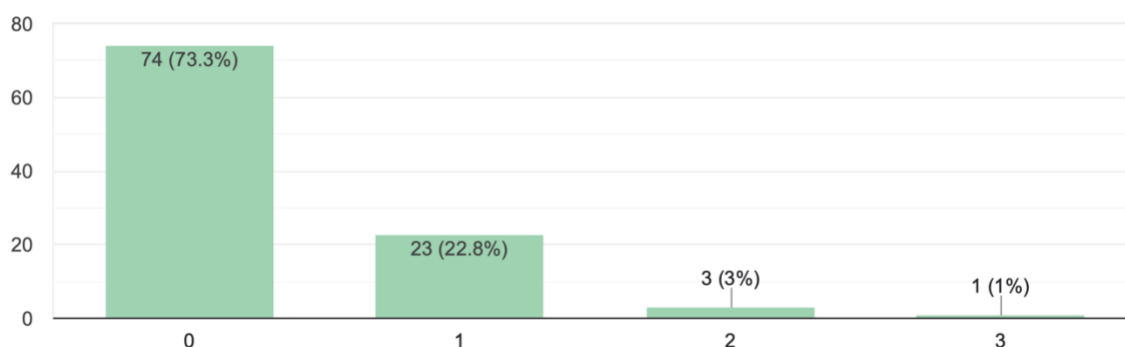
4.3.1 Breathlessness while dressing yourself

Scale	Pre Covid - 19	Percentage	Post Covid - 19 (now)	Percentage
0 (nil)	74	73.3	25	24.8
1 (mild)	23	22.8	41	40.6
2 (moderate)	3	3	24	23.8

3 (severe)	1	1	11	10.9
Total	101	100	101	100

Breathlessness while dressing yourself - Pre-Covid

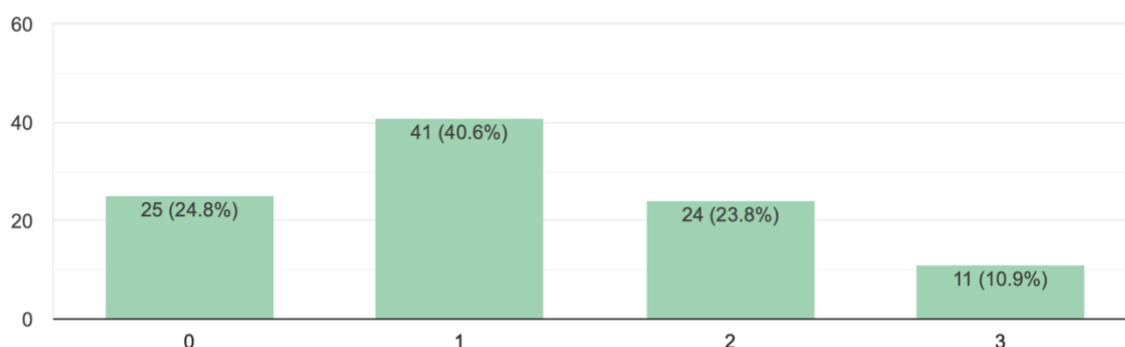
101 responses



From the above graph it is clear that during preCovid condition 73.3% were not having any breathing problem and 22.8 were having mild (that is range of 1) breathlessness while dressing, 3% were having range of 2 severity in breathing while dressing and only 1% were having high range (that is 3) breathing problem while dressing .

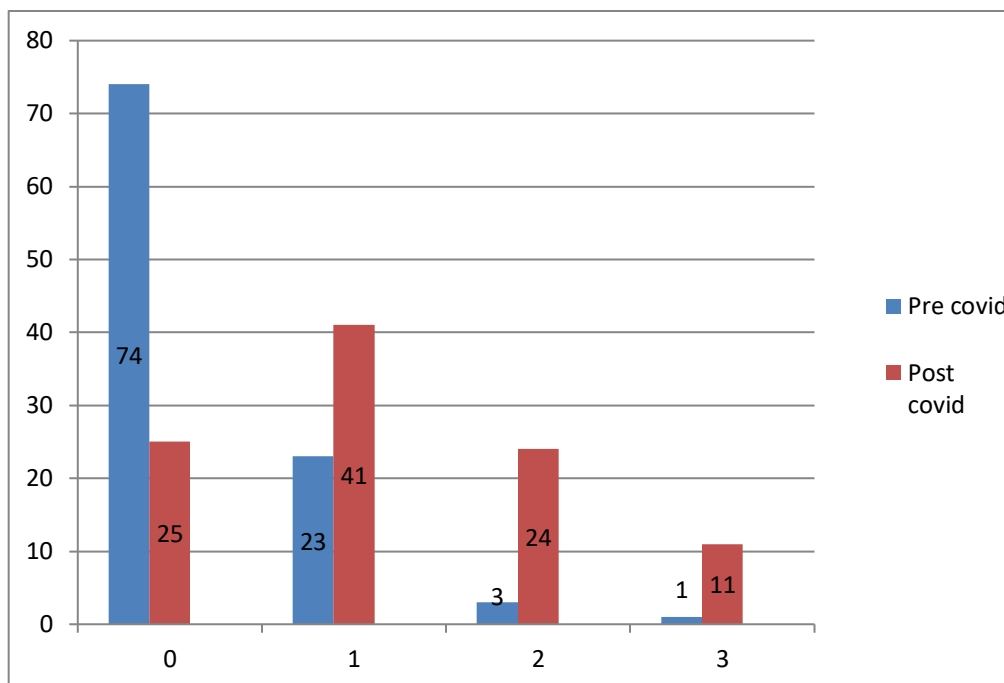
Breathlessness while dressing yourself - Now

101 responses



From the above graph it is clear that now 24.8 % were not having any breathing problem and 40.6 % were having mild (that is range of 1) breathlessness while dressing, 23.8 % having range of 2 severity in breathing while dressing and 10.9 % having high range (that is 3) breathing problem while dressing . So from the analytical study it is clear that the people who never had breathlessness while dressing prior to

Covid – 19 were about 74% and after Covid – 19 it became higher in an 11 % increase and 23.8% and 40.6% had mild problems with breathing as well. In conclusion we found that there were a huge increase in breathlessness while dressing

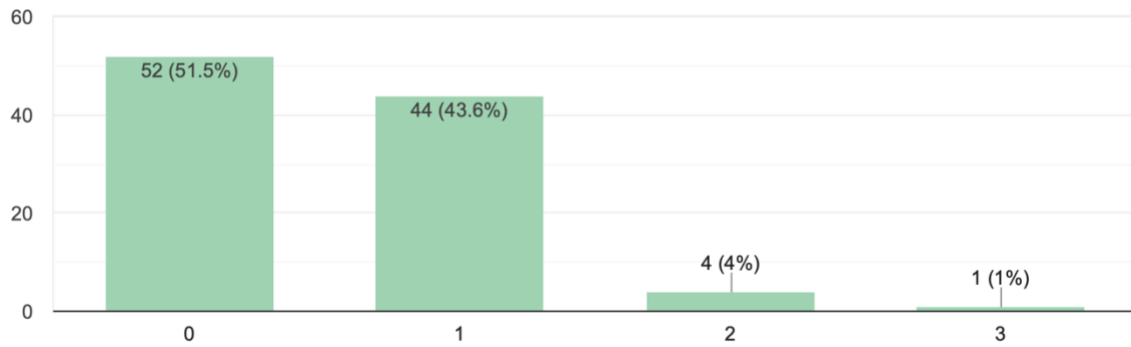


4.3.2 Breathlessness on walking up a flight of stairs

Scale	Pre Covid-19	Percentage %	Post Covid-19 (now)	Percentage
0 (nil)	52	51.5	10	9.9
1 (mild)	44	43.6	29	28.7
2 (moderate)	4	4	49	48.5
3 (heavy)	1	1	13	12.9
Total	101	100	101	100

Breathlessness on walking up a flight of stairs - Pre-Covid

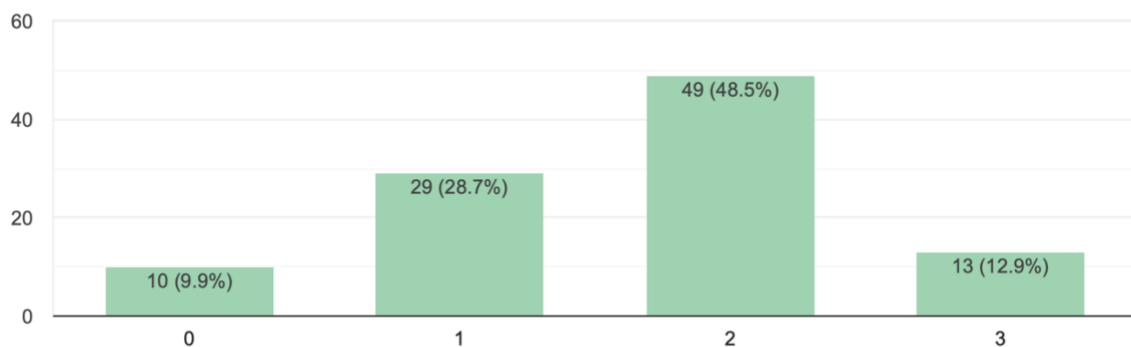
101 responses



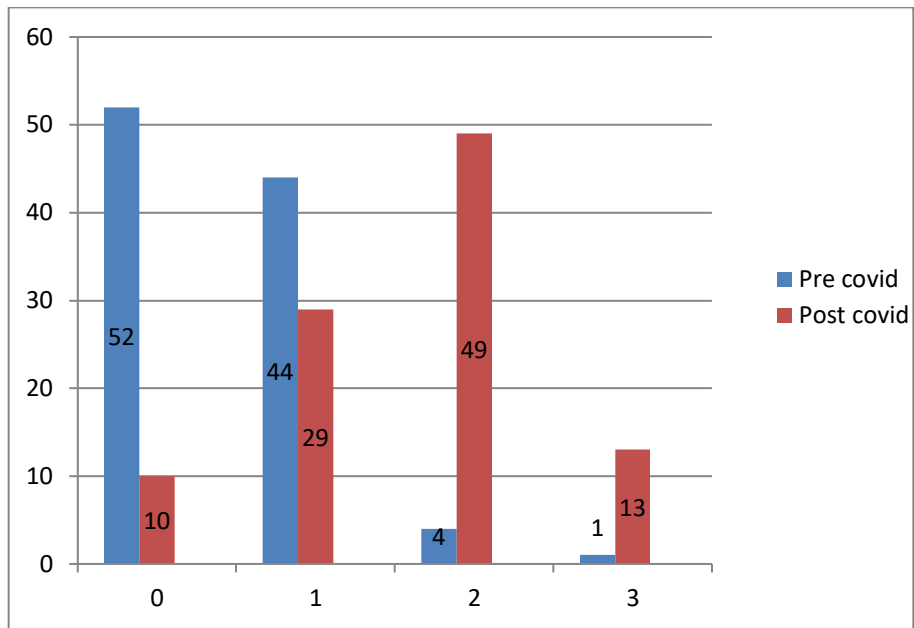
From the above graph it is clear that 51.5% were not having any problem right before Covid, 43.6% were having mild problems , 4% were having more severe problems (that is range 2) and only 1% were having high severity in breathing while walking up a flight of stairs.

Breathlessness on walking up a flight of stairs - Now

101 responses



From the above graph it is clear that 9.9% were not having any problem right now or after Covid, 28.7% were having mild problems , 48.5 % were having moderate problems (that is range 2) and 12.9 were having high severity in breathing while walking up a flight of stairs. Therefore from the graph it is clear that there is a huge increase in the number of people developing problems with their breathing on walking up a flight of stairs. Before Covid it 51.5% of people didn't have any problem with breathlessness while flying up the stairs and after Covid only 9.9% did not have that problem among 101 subjects the rest of all were experiencing breathlessness on walking up flights of stairs. So Covid results in an increase in breathlessness on walking up stairs.

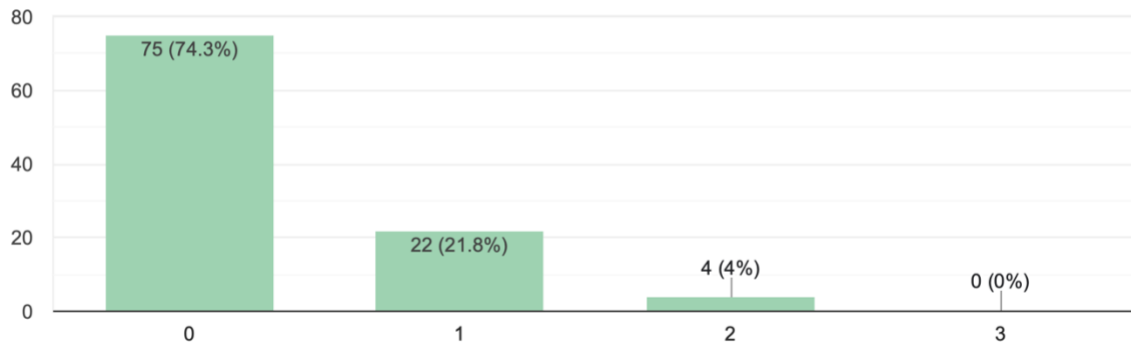


4.3.3 Breathlessness at rest

Scale	Pre Covid - 19	Percentage %	Post Covid – 19 (now)	Percentage
0 (nil)	75	74.3	28	27.7
1 (mild)	22	21.8	30	29.7
2 (moderate)	4	4	38	37.6
3 (severe)	0	0	5	5
Total	101	100	101	100

Breathlessness at rest - Pre-Covid

101 responses

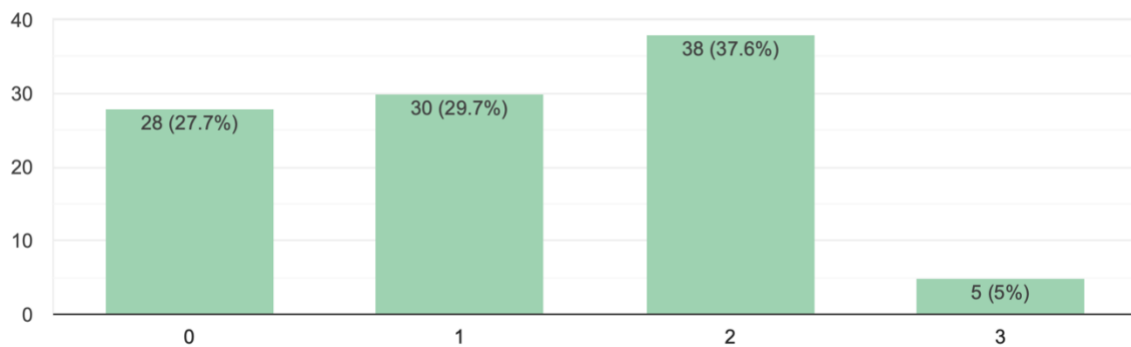


From the above graph it is clear that before Covid 74.3% were not having any problem, 21.8% were having mild or only range of 1 problem with breathing at rest, 4% were having more problem with breathing before Covid and 0% were experiencing high intense problem with breathing at rest.

From the analysis we concluded that there is a huge spike in the number of people who have been affected by post-Covid breathlessness problem and several studies have been done regarding this problem that present in humans after Covid.

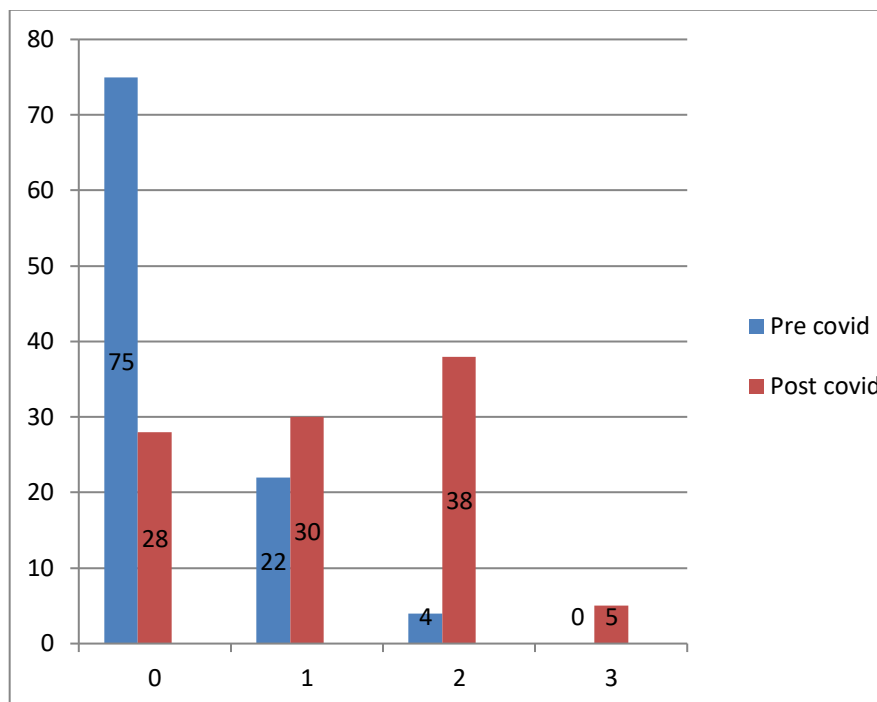
Breathlessness at rest - Now

101 responses



From the above graph it is clear that now or after Covid 27.7% were not having any problem but 29.7% having mild or only range of 1 problem with breathing at rest, 37.6% were having more problem with breathing after Covid and 5% were experiencing high intense problem with breathing at rest. So from the graph it is clear that before Covid 74.3% were not having any breathlessness problem at rest but after Covid it has raised into more than double only 27.7% was not having problem after Covid and all the others,

about 75% of other had developed breathlessness after Covid, thus we concluded that Covid has affected middle aged men and women with breathlessness problem at rest as well.



4.4 CARDIOVASCULAR DISORDERS IN THE SUBJECTS

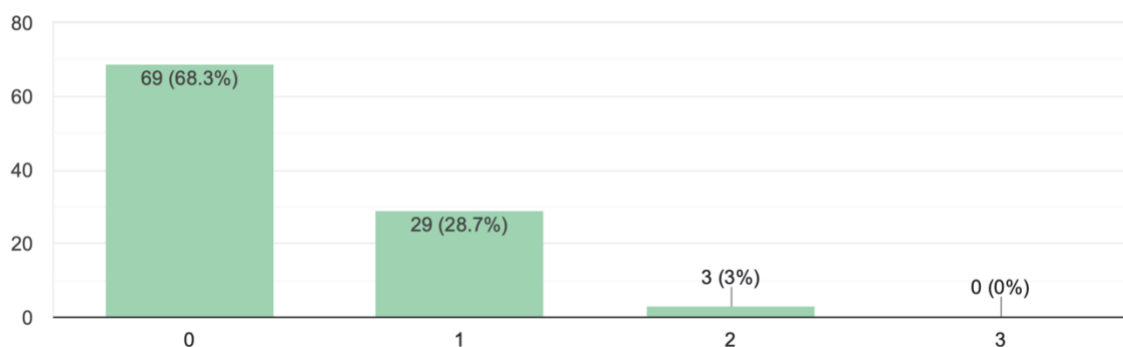
4.4.1 Chest Pain

Scale	Pre Covid-19	Percentage	Post Covid – 19 (now)	Percentage

0 (nil)	69	68.3	33	32.7
1 (mild)	29	28.7	29	28.7
2 (moderate)	3	3	26	25.6
3 (severe)	0	0	13	12.9
Total	101	100	101	100

Chest Pain - Pre-Covid

101 responses

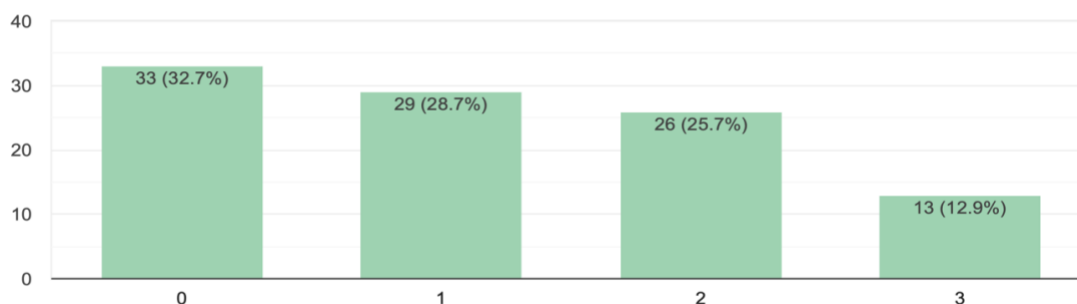


From the

data collected, almost 70% of the respondents never had Chest pain or similar cardiovascular issues prior to Covid-19. The rest 30% of the participants had some sort of heart-related problem.

Chest Pain - Now

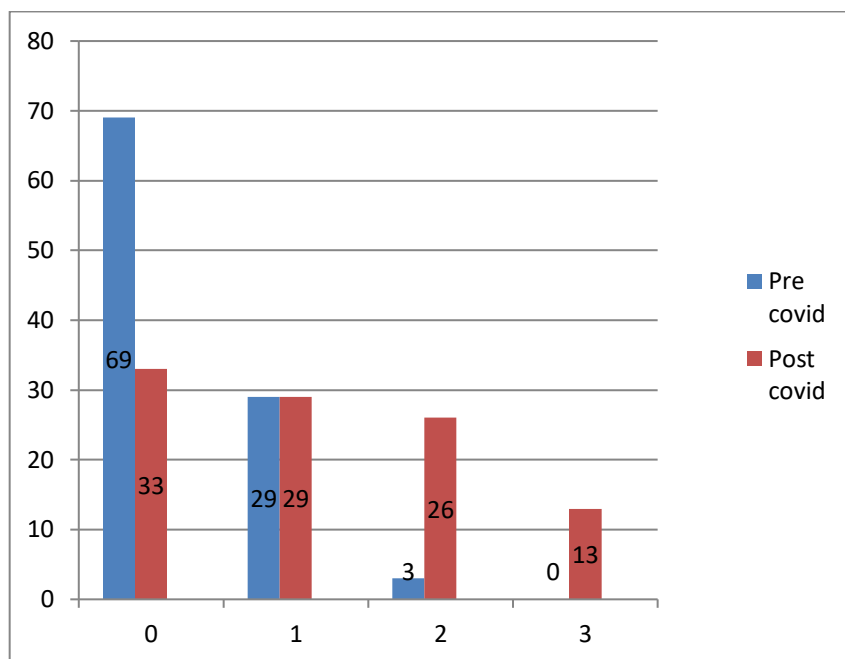
101 responses



From the graph it is clear that the percentage of the respondents who never had any heart-related issues such as chest pain prior to Covid – 19 has gone down from 70% to 33%. i.e., almost half of the people who never had any cardiovascular issues now face mild or severe chest pain after being diagnosed with the virus. From the above graph, we can say that around 28.7% of the sample size had mild chest pain after the diagnosis, which is similar to the Pre – Covid numbers. But the number of people who had severe chest

pain has increased from 3% to 25.7%. There was 0 subject with severe chest pain before covid and it was increased to 12.9% after covid, which is proof that cardiovascular diseases have been increasing tremendously among the sample size after Covid – 19.

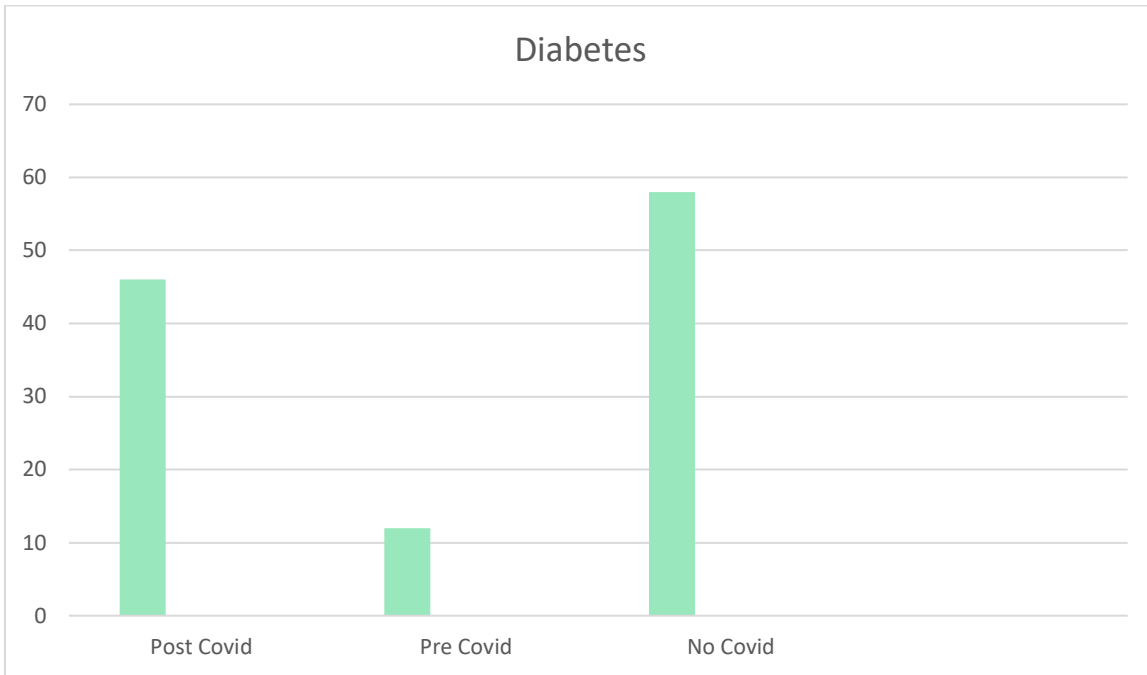
In conclusion, we can say that there is a huge spike in the number of people who have been affected by post-Covid Cardiovascular issues.



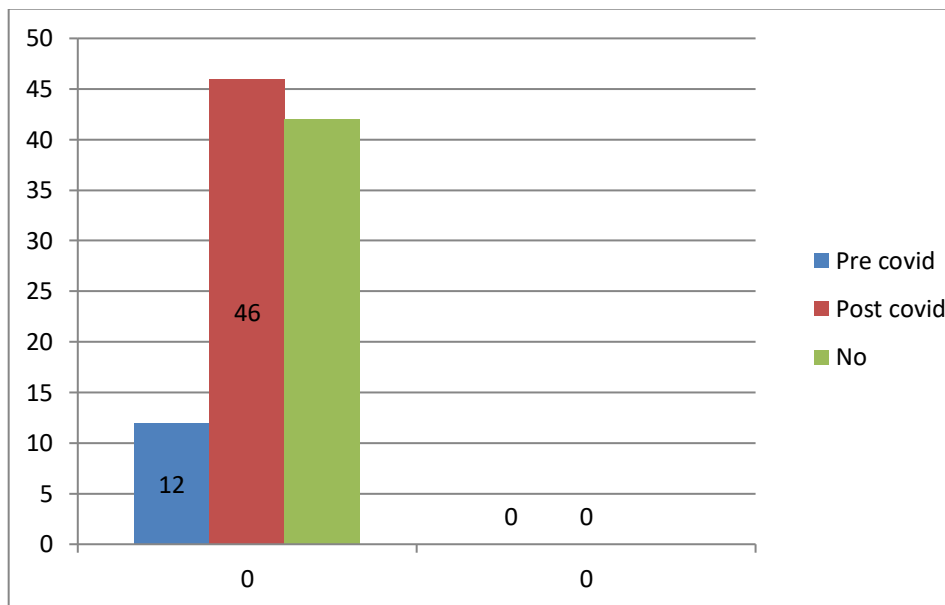
4.5 DIABETES DISEASE IN THE SUBJECTS

4.5.1 Diabetes

	Pre Covid - 19	Percentage	Post Covid - 19	Percentage
Presence of Diabetes Disease	12	11.8	46	45.54
Total	101	11.8	101	45.54



From the graph it was clear that before Covid only 11.8 % of subject were having diabetes and also it is clear that about 44.54% of subjects were affected with diabetes after Covid – 19. So that in conclusion we found that before Covid, only 11.8% of the subjects were having diabetes disease but after Covid percentage came to 45.54% were affected with diabetes and it is very clear that the number of people affected with diabetes after Covid had raised. Thus we can say that the Covid – 19 increases diabetes among people after being infected with this virus.



5. SUMMARY AND CONCLUSION

A coronavirus identified in 2019, SARS-CoV-2, has caused a pandemic of respiratory illness, called COVID-19. COVID-19 can be severe, and has caused millions of deaths around the world as well as lasting health problems in some who have survived the illnesses. Many studies have already been conducted to identify these Post Covid – 19 symptoms or diseases.

Major findings of the current study titled “Post Covid-19 Effects In Middle Aged Men And Women (40 – 60 Years)” are summarised as follow:

The major findings of the study are summarised as follows:

- Out of 101 subjects 32.6 % belonged to the age group 40-46, 34.6% belonged to the age group 47-52, 32.6% belonged to the age group 53-60. From this we could understand that most of the subjects belong to 40-46 range of age.
- 45.6 % of the subjects were males and 54.6 % were females out of 101 respondents. So it was clear that the majority is female.
- From the study it was found that many of them had breathlessness or breathing problems after Covid while dressing and only 24.8 % were not having any breathlessness problem , about 40.6 % having mild problems and 23.8% and 10.9% were having high intense problems.
- From the study it was found that after Covid -19 as post Covid effects only 9.9% were not having breathlessness on walking up flights on stairs 28.7% have mild problem with a range 1, 48.5% were having severe breathlessness problem on taking up stairs and about 12.9% were having more or higher severe problem.
- From the study it was found that 27.7% of them were not having problems with breathing at rest and 29.7% were having mild problems with breathing at rest , about 37.6% were having severe breathing problems and 5% were having or experiencing high intense breathlessness at rest.
- From the study it was found that 45.54% were having diabetes after Covid -19, none of them were having diabetes before Covid.
- From the study it was clear that 40.6% of the subjects were having mild problems with concentration whereas 32.7% were having moderate concentration problems and 8.9% were having severe issues on concentration after covid.
- It was found that 59.4% of the subjects were not having memory problems before covid but after that it decreased to 22.8% which shows the hike in memory problems after covid.

- After covid 29.7% were having minor memory problems whereas 35.6% of participants were having moderate memory problems and 11.9% were having severe memory issues.
- From the study it was found that 30.7% of the subjects were having mild feelings of anxiety whereas 29.7% of the subjects were having moderate level of anxiousness and 8.9% of the subjects were having severe anxiety problems after covid.
- 45% of the respondents have been facing a small level of depressed thoughts/issues post Covid – 19. More importantly, close to 40% of the respondents are facing average or above-average levels of depression in the past few years after getting infected with the virus.
- The percentage of the respondents who never had any heart-related issues such as chest pain prior to Covid – 19 has come to 33%. i.e., almost half of the people didn't had any cardiovascular issues. But now they faced mild or severe chest pain after being diagnosed with the virus.
- The number of people who had severe chest pain has increased from 3% to almost 39% which is proof that cardiovascular diseases have been increasing tremendously among the selected subjects after Covid – 19.

CONCLUSION

Coronavirus disease 2019 (COVID-19) is a contagious disease caused by a virus, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease quickly spread worldwide, resulting in the COVID-19 pandemic. Post COVID-19 Condition (PCC) is a condition that is usually diagnosed after 3 months from the start of COVID-19, lasts for at least 2 months, and cannot be explained by an alternative diagnosis. We have conducted a study on 101 participants and analysed that they are having psychological, breathing problems, cardiovascular problems and development of new diseases such as diabetes. From the study we conclude that more than 80% of the sample were having psychological problems mainly depression after covid. In the case of breathlessness 72% of the subjects were facing difficulty in breathing mainly during rest and in the case of diabetes many subjects about 45.5 % developed diabetes after Covid. It is also clear that the percentage of the respondents who never had any heart-related issues such as chest pain prior to Covid – 19 has gone down from 70% to 33%. i.e., almost half of the people who never had any cardiovascular issues now face mild or severe chest pain after being diagnosed with the virus. In conclusion we found that the people who had been affected with Covid – 19 have more chances to develop these conditions such as psychological, breathing problems, cardiovascular disease and diabetes. So it is necessary to find a proper tool for treating this condition otherwise it will lead to more complications and thus it can become more worsen in later years.

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APPENDIX

Modified COVID-19 Yorkshire Rehabilitation Screening (C19-YRS)

Self-report version

Patient name:

NHS number:

Date:

Time:

The purpose of this questionnaire is to find out more about your current problems following COVID-19 illness. Your responses will be recorded in your clinical notes. We will use this information to monitor your symptoms, offer treatments and assess response to treatment.

This questionnaire will take around 15 minutes. If there are any topics you don't want to talk about you can choose not to respond.

Do you consent for this information to be used for audit and research as well ? Yes No

SYMPTOM SEVERITY

Please answer the questions below to the best of your knowledge.
 'Now' refers to how you feel now/this week (last 7 days).
 "Pre-COVID" refers to how you were feeling prior to contracting the illness.
 If you are unable to recall this, just state 'don't know'

Rate the severity of each problem on a scale of 0-3:

0 = None; no problem

1 = Mild problem; does not affect daily life

2 = Moderate problem; affects daily life to a certain extent

3 = Severe problem; affects all aspects of daily life; life-disturbing

1. Breathlessness	Breathlessness:	Now	Pre-COVID
	a) At rest	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
	b) Changing position e.g. from lying to sitting or sitting to lying	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
	c) On dressing yourself	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
	d) On walking up a flight of stairs	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
2. Cough/ throat sensitivity/ voicechange	Cough/ throat sensitivity	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
	Change of voice	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
3. Fatigue (tiredness	Fatigue levels in your usual activities	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>

not improved by rest)			
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4. Smell/taste	Altered smell	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
	Altered taste	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
5. Pain/discomfort	Chest pain	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
	Joint pain	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
	Muscle pain	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
	Headache	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
	Abdominal pain	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
6. Cognition	Problems with concentration	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
	Problems with memory	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
	Problems with planning	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
7. Palpitations/ dizziness	Palpitations in certain positions, activity or at rest	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
	Dizziness in certain positions, activity or at rest	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
8. Post-exertional malaise (worsening of symptoms)	Crashing or relapse hours or days after physical, cognitive or emotional exertion	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
9. Anxiety/ mood	Feeling anxious	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
	Feeling depressed	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
	Having unwanted memories of your illness or time in hospital	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
	Having unpleasant dreams about your illness or time in hospital	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
	Trying to avoid thoughts or feelings about your illness or time in hospital	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
10. Sleep	Sleep problems, such as difficulty falling asleep, staying asleep or oversleeping	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>

FUNCTIONAL ABILITY

11. Communication	Difficulty with communication/word finding difficulty/understanding others	Now	Pre-COVID
		0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
12. Walking or moving around	Difficulties with walking or moving around	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
13. Personal care	Difficulties with personal tasks such as using the toilet or getting washed and dressed	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
14. Other activities of Daily Living	Difficulty doing wider activities, such as household work, leisure/sporting activities, paid/unpaid work, study or shopping	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
15. Social role	Problems with socialising/interacting with friends* or caring for dependants *related to your illness and not due to social distancing/lockdown measures	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>

OTHER SYMPTOMS

Please select any of the following symptoms you have experienced since your illness in the last 7 days. Please also select any previous problems that have worsened for you following your illness.

- Fever
- Skin rash/ discolouration of skin
- New allergy such as medication, food etc
- Hair loss
- Skin sensation (numbness/tingling/itching/nerve pain)
- Dry eyes/ redness of eyes
- Swelling of feet/ swelling of hands
- Easy bruising/ bleeding
- Visual changes
- Difficulty swallowing solids
- Difficulty swallowing liquids
- Balance problems or falls
- Weakness or movement problems or coordination problems in limbs
- Tinnitus
- Nausea
- Dry mouth/mouth ulcers
- Acid Reflux/heartburn
- Change in appetite
- Unintentional weight loss
- Unintentional weight gain
- Bladder frequency, urgency or incontinence
- Constipation, diarrhoea or bowel incontinence

- Change in menstrual cycles or flow
- Waking up at night gasping for air (also called sleep apnea)
- Thoughts about harming

yourself Other symptoms – free

text

OVERALL HEALTH

How good or bad is your health overall in the last 7 days?

For this question, a score of 10 means the BEST health you can imagine. 0 means the WORST health you can imagine.

a) Now: WORST HEALTH 0 1 2 3 4 5 6 7 8 9 10 BEST HEALTH

b) Pre-Covid: WORST HEALTH 0 1 2 3 4 5 6 7 8 9 10 BEST HEALTH

EMPLOYMENT

Occupation: _____

Has your COVID-19 illness affected your work??

- No change
- On reduced working hours
- On sickness leave
- Changes made to role/ working arrangements (such as working from home or lighter duties)
- Had to retire/ change job
- Lost job

Any other comments/concerns: _____

PARTNER/FAMILY/CARER PERSPECTIVE

This is space for your partner, family or carer to add anything from their perspective: