

# THE HEALTHCARE MANAGEMENT OF POST-COVID DISEASE RECOVERY COMPLICATIONS: A PATIENT-CENTRIC APPROACH STUDY



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## ABSTRACT

The COVID-19 illness, as a global pandemic is an emerging and rapidly evolving situation that has collapsed the health departments of the world. It has also shattered the economy of the different nations in the world. Body immunity is the key factor highlighted in many types of research to prevent COVID-19 disease. People with co-morbidities like diabetes, hypertension, cardiovascular disease, and respiratory issues are at higher risk of having COVID-19. The studies have revealed that people with pre-existing conditions face a higher mortality rate as compared to people affected with no co-morbidities. It also depends on age as the general immunity reduces as you get older. This study talks about the co-morbidity impact on COVID-19, co-morbidity chronic problems, and their treatment for proper healthcare management. It also explores the Post- COVID-19 symptoms and the health management implications involved in long -term effects. The measures to improve the public health and recovery of patients post Covid-19 illness has great significance and important implications for society in terms of livelihood and work productivity.

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|---------------------------|---|
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## INTRODUCTION

The global COVID-19 pandemic emerged and rapidly evolved collapsing the health departments. It has also shattered the economy of the different nations of the world. Many Governments have imposed lockdowns to prevent the spread of the virus. Various Government advisory was also issued to follow social distancing, wear masks, and washing hands continuously/ sanitizing. Body immunity is the key factor highlighted in many types of research to prevent COVID-19 disease (Peng, 2020).

However, the symptoms may range from mild to severe depending upon the degree of severity. At the primary level, the virus spreads through droplets of saliva or discharge from the nose when an infected person coughs or sneezes, so it is important to wear a mask and follow respiratory etiquettes listed in the Government advisory. (WHO,2020)

Since COVID-19 is a new disease and we have very bounded data & information about its impact, two groups were considered to be highly susceptible to the virus; older people (more than 60 years), and people with underlying co-morbidities such as cardiovascular disease, diabetes, hypertension, respiratory illness, etc. (WHO,2020)

It is also observed that many older drugs for different symptoms have been re-purposed after control trials in different countries and prescribed for observed limited anti-viral effects to control the COVID-19 infections; pharmaceutical companies were quick to turn around and supply the sudden demand. The pharmaceutical companies widely promoted the vitamins and minerals as physicians prescribed it, based on observational studies in different parts of the world. (Healthline,2020)

## LITERATURE REVIEW

### 1) Co-Morbidity Chronic Problems

The COVID-19 virus has almost infected all age groups. However, the impact also depends upon an individual's body immunity; general immunity reduces as you get older. The studies have revealed that people with pre-existing conditions face a higher mortality rate than people affected with no co-morbidities. Since COVID-19 is a new disease, we have very bounded data & information about its impact on underlying medical conditions (CDC, 2021)

The two groups are more susceptible to the virus; older people (more than 60 years), and people with Co-morbidities such as cardiovascular disease, diabetes, hypertension, respiratory illness, etc. In the guidelines published by WHO, the risk of this virus increases with age starting from 40 years (WHO, 2020)

As time evolved, HERD IMMUNITY is the new concept that came into play. Herd immunity is a condition obtained when most of a population becomes immune to an infectious disease, thus preventing the spread of the disease. The scientists believe that herd immunity is the best way



to control the spread of the virus that can be achieved in two possible ways – the vaccination of most of the population to achieve immunity or many people acquire the disease and build an immune response. This is known as Natural Immunity (Health Narayana, 2020)

## **2) Co morbidity and Its Effect on The Patients with COVID-19**

The studies have revealed that people with pre-existing conditions face a higher mortality rate than people affected with no co-morbidities. They have often been associated with increased hospital complications. In one of the studies, it was found that 48% of the patients who passed away after the treatment had underlying CO-morbidities. (Health Narayana, 2020)

### **Hypertension**

People suffering from hypertension need to take special care of them as hypertension reduces the body immunity & makes the body more prone to the virus. In the case of hypertension patients, the receptors in the body namely ACE2 are down regulated; the interaction of these receptors with coronavirus infection through its protein called spike-protein further brings down the level of these receptors (Health Narayana, 2020)

### **Diabetes**

People with an uncontrolled level of sugar and Type 2 Diabetes are more prone to the virus. Poor glycemic levels cause a deleterious impact on the body's capability to fight against the virus and even cause subordinate bacterial infections in the lung & abdomen. In the case of diabetes, the body's ability to dispose of toxins from the blood is damaged, which further leads to severe conditions such as obesity, ischemic heart disease, etc. (Health Narayana, 2020)

### **Cardiovascular Diseases**

Pre-existing cardiovascular co-morbidity patients have shown notable myocardial damage and raised cases of cardiovascular collapse in context with inflammation in heart muscles. The patients with coronary heart disease are feasible to witness supply-demand mismatch of oxygen to cardiac musculature with further aggravated the scenario and leads to severe cardiomyopathy & poor outcome. (Health Narayana, 2020).

## **3) Re-Purposed Drugs**

It has also been observed that many older drugs for different symptoms have been re-purposed after control trials in different countries and prescribed for observed limited anti-viral effects to control the Covid infections; pharmaceutical companies were quick to turn around and met the sudden demand. There has also been a great deal of promotion of vitamins and minerals by these companies as physicians prescribed it, based on observational studies in a different part of the world (Health line, 2020).

Many drugs such as Hydrochloroquine, Dexamethasone, Remdesivir, and Azithromycin were used in treating COVID-19. However, UK's Drug Safety Research Unit had issued a review on the challenges & benefits of Re-purposed drugs for COVID-19. The review winds up that re-purposed drugs still need to undergo attentive testing to be safe and effective. According to the review among re-purposed drugs, only Remdesivir, an antiviral that originated for Ebola



Virus was licensed to be used in the treatment of COVID-19 (European Pharmaceutical Review, 2020)

#### **4) Post-COVID-19 Disease recovery complications**

Post recovery, depending upon the severity of the disease, the patients may continue to face a range of health issues. The most reported post-recovery symptoms of COVID-19 are-irregular heartbeat, severe muscle pain, fatigue, shortness of breath, chest pain, continued loss of taste & smell, and in severe cases, lung damage, kidney damage, and even multiple organs damage. (Easy Pharm, 2020).

The people who continue to experience symptoms even after initial recovery from COVID-19 are referred to as “Long Haulers,” & the condition is termed as POST-COVID-19 Syndrome (Clinic Mayo, 2020).

As many as 87.4% patients continued to experience symptoms even after two months of being discharged from the hospital, says *Journal of American Medical Association* report published in February 2021. Such people are being divided into two groups:

- a) The people who continue to experience dry cough & body ache, from which they will eventually recover.
- b) The patient who had severe pneumonia & experience total scarring of the lung after they recover; this issue is a matter of critical health concern (Dey, 2020).

Blood clots and Blood vessel problems are other post-covid disease recovery complications. A new research scientist revealed that COVID-virus stimulates the production of antibodies circulating through the blood, causing clots in people hospitalized with the disease. These antibodies trigger clots in arteries, veins, and microscopic vessels. Life-threatening events such as strokes are caused by blood clots (Malcom, 2020).

### **OBJECTIVES OF THE STUDY**

1. To study post-COVID-19 recovery complications
2. To study the impact of each co-morbidity problem on COVID-19 illness.
3. To study Re-purposed drugs.

### **SCOPE OF THE STUDY**

- The study covers a survey with a structured questionnaire from COVID-19 Patients around different regions.
- The study will help to understand POST-COVID-19 Disease recovery complications.
- The study will also help understand the impact of each co-morbidity problem on COVID-19 and the Re-purposed drugs used in the treatment of COVID-19.



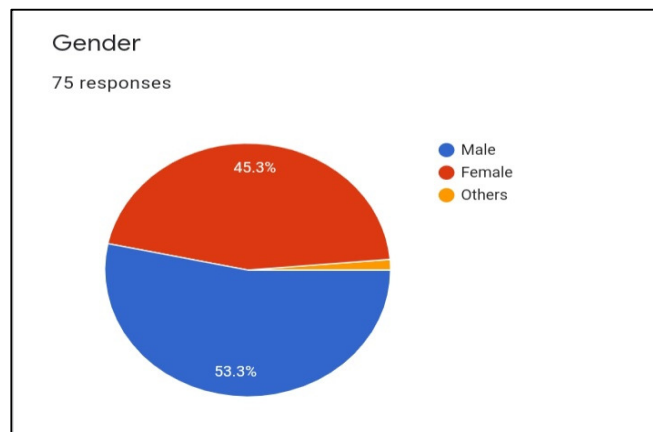
## RESEARCH METHODOLOGY

- **Research Design:** It is informative and explanatory. Both qualitative and quantitative approaches are adopted.
- **Questionnaire Design:** The questionnaire consists of different sections of questions related to variables under study and variables mapped to objectives to obtain what we are trying to find out from the respondents. The questions are weighted in percentages marked by COVID-19 patients for each question as per their perception.
- **Sources of Data:** The researcher collected the data by getting a questionnaire filled up by COVID-19 Patients over online media and through emails, which helped in quantitative analysis. The telephonic interview assisted in having a profound qualitative insight into COVID-19 patients. The researcher has also referred to various articles, Case studies, journals, and brochures on websites.
- **Sample Design:** The method of convenience and snowball sampling method was chosen through each person's referral for another COVID-19 patient he/ she knew. For analysis, a sample of around 100 patients was selected; out of them, the data from 75 patients were complete. The patients were approached based on their availability, and patients were appealed to respond. We cannot force them to respond.

## ANALYSIS & DISCUSSION

A plot of around 75 COVID-19 Patients was done, which helped to clarify the variables under the main study. The descriptive method of result analysis was adopted. The Google forms were used for online data collection, and the spreadsheets were used to derive pie charts for analysis & interpretations. The average was calculated based on percentage response.

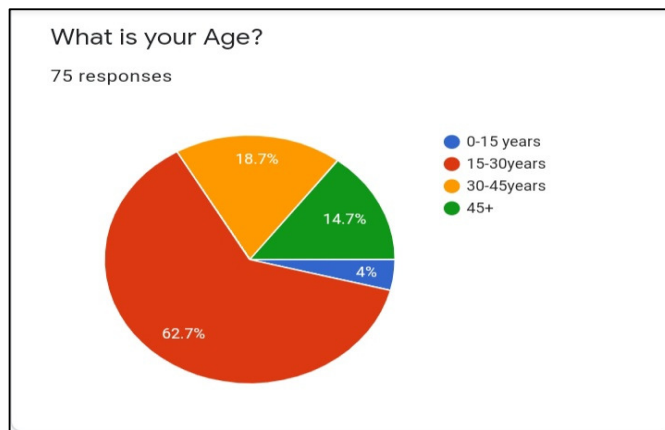
**Figure 1: Gender**



Source: Author compilation

During the survey, it was found that 53.3% of respondents were male, and 45.3% were female

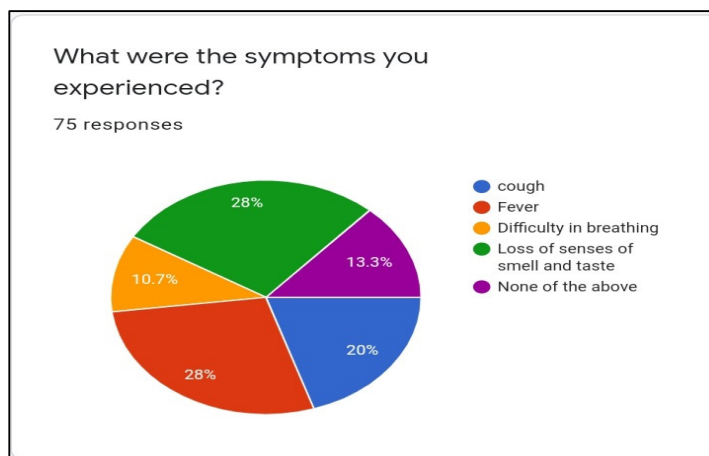
**Figure 2: Age**



Source: Author compilation

During the survey, it was found that the majority of the respondent (62.7%) were 15-30 years, whereas 18.7% were 30-45 years followed by (14.7%) 45+ and (4%) 0-15 years.

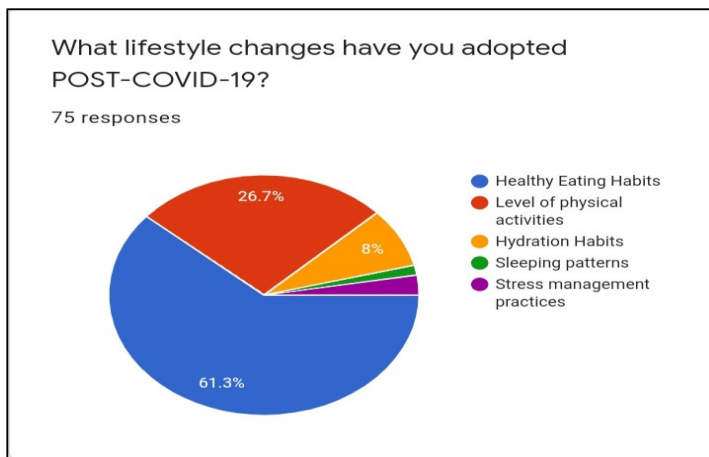
**Figure 3: Symptoms Experienced**



Source: Author compilation

COVID-19 affects different people differently, however, the common symptoms are cough, fever, difficulty in breathing, loss of senses of taste and smell, and others. The survey observed that 28% of people experienced a loss of taste and smell. The same proportion of people experienced fever, like a fever followed by cough (20%), difficulty in breathing (10.7%). However, 13.3% of patients were asymptomatic.

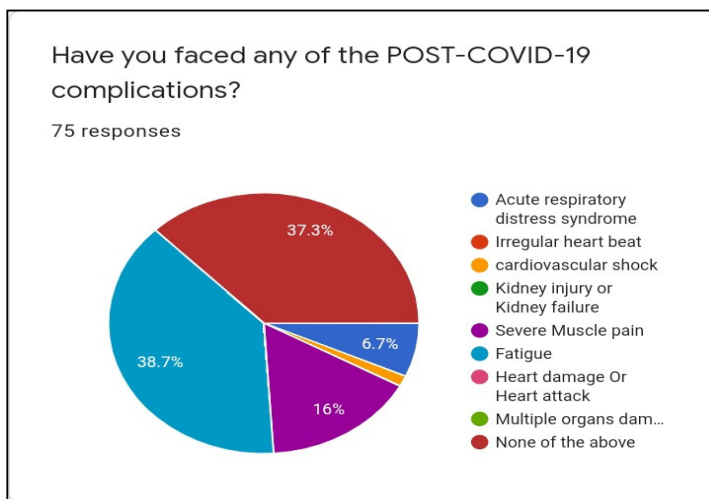
**Figure 4: Lifestyle changes post-COVID-19**



Source: Author compilation

Immunity is the key factor highlighted in many types of researches to fight COVID-19. However, immunity also depends upon age; general immunity reduces as we get older. During the survey, it was found people have adopted lifestyle changes after recovery from COVID-19. 61.3% of patients have adopted healthy eating habits, followed by 26.7% adoption of higher physical activities.

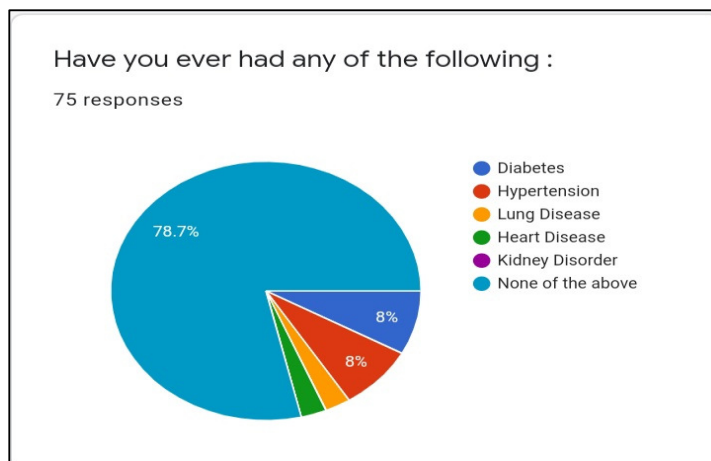
**Figure 5: Post-COVID-19 disease recovery complications**



Source: Author compilation

38.7% of patients experienced fatigue as a post-COVID-19 complication symptom. 37.3% of patients did not face any complications, 16% experienced severe muscle pain. However, 6.7% of COVID-19 patients came across acute respiratory distress as a post-COVID-19 complication.

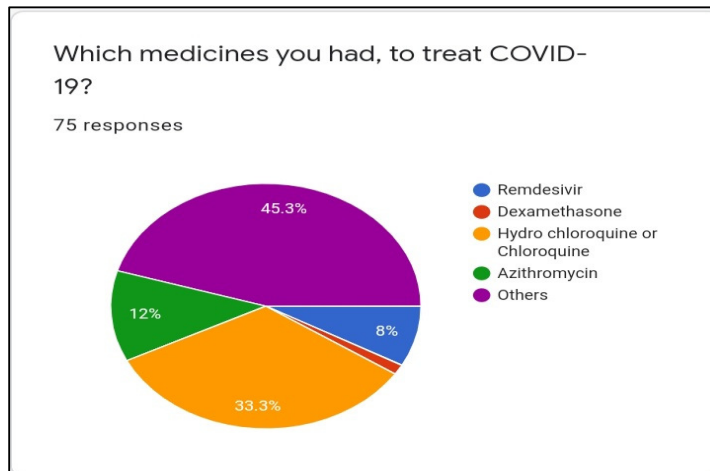
**Figure 6: Underlying co-morbidity**



Source: Author compilation

The survey finds that 78.8% of COVID-19 patients did not have any underlying co-morbidity; it could be because most of the respondents were between 15-30 years of age. 8% had diabetes, and 8 % had Hypertension as an underlying co-morbidity which could be genetic in some cases while a lifestyle disorder in others.

**Figure 7: Re-purposed drugs**



Source: Author compilation

During the survey, it was observed that the majority of COVID-19 patients (45.3%), did not know about the drug used in treatment because the people didn't have much knowledge about the drug. 33.3 % were treated with Hydrochloroquine or Chloroquine, 12% were treated with Azithromycin, remaining 8% were treated using Remdesivir, an antiviral originated for the Ebola virus.



## CONCLUSIONS

Thus, we summarize and conclude, corresponding to each of the objectives:

1. The COVID-19 patients have a persistent effect even after the recovery; there is restricted evidence regarding long-lasting COVID-19 symptoms after the infection is gone. However, there have been reports of individuals still encountering symptoms months after infection, including continued loss of taste or smell, irregular heartbeats, chest pain, shortness of breath, extreme fatigue, and recurring fever. In a survey majority of patients came across fatigue as a main post-COVID-19 disease complication.
2. The existence of co-morbidities in patients with COVID-19 infection has often been associated with increased in-hospital complications and mortality. COVID-19 has a deleterious impact on patients with co-morbidities. Our study found that 16% of patients had underlying co-morbidity, which led to increased hospital complications. To cope with an impact, the patients have adopted healthy eating habits and increased physical activities to keep them healthy.
3. Developing new drugs is a costly & time-consuming process that can take extreme investment and several years to complete. To cope up with COVID-19 many older drugs were re-purposed after the control trials in different countries & prescribed for observed anti-viral effects. In our study, we found that Hydrochloroquine was widely used, followed by Azithromycin & Remdesivir.

## LIMITATIONS

1. Not all respondents responded so the study cannot give 100% accurate results.
2. Some of the patients were reluctant to have communication so that the response could be a bit biased.
3. The sample size could have been larger.



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