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Research Article

A SURVEY BASED STUDY ON THE IMPACT OF THE COVID-19 PANDEMIC ON HEALTH AND WELLBEING

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ABSTRACT

The current study aims to collate and analyze information on the health and wellbeing of people in the COVID-19 pandemic. An online survey was conducted using Google form which was distributed using social media platforms and the results were evaluated statistically. The demography profile of 181 respondents was recorded and 87.8% of the test population belonged to the age group of 19-45 years. Most of the COVID-19 infected individuals in this age group did not have any pre-existing diseases. During the progression of the infection in the test population, 43.6% experienced mild symptoms, 32% had moderate symptoms, 16.6% were asymptomatic, whereas 7.7% experienced severe symptoms. The symptoms were less severe in those people who were either partially or fully vaccinated in comparison to non-vaccinated individuals ($p=0.005$). Amongst the vaccinated population, 80.2% had been vaccinated with Covishield, 18.8% with Covaxin and the remaining received other vaccine brands. The recovery period was affected by the body mass index (BMI) of individuals ($p=0.029$), their sleeping patterns ($p=0.002$), and the severity of their symptoms ($p=0.015$). After the initial recovery, 35.3% of people said that they have been experiencing Long-COVID symptoms. People with Long-COVID experienced fatigue, headache, brain fog, and joint or muscle pain. Post-COVID, 12.2% of the test population carried out rigorous physical activity, 43.1% were lightly active, and 32% were moderately active. Supplements like vitamin C and zinc were consumed by the people to aid their recovery. It was observed that COVID-19 has impacted the mental health and work-life of the respondents.

Keywords: COVID-19 pandemic, Covishield, Covaxin, Long-COVID.

1. INTRODUCTION

Coronavirus disease 19 (COVID-19), caused by a novel coronavirus SARS-CoV-2, first appeared in Wuhan, China, in early December 2019. The highly infectious novel coronavirus has spread quickly throughout the world in just a few months. The number of cases and deaths surged substantially ever since the beginning of 2020 [1]. On March 11, 2020, WHO Director-General, Dr. Tedros Adhanom Ghebreyesus, at the media briefing on COVID-19, declared that WHO has labeled the COVID-19 breakout a global pandemic [2]. On April 12, 2021, India surpassed Brazil to become the second-worst hit country after the United States [3]. The number of COVID-19 cases peaked in September 2020 (the first wave) and in May 2021(the second wave) in India. Recently, there is an alarming increase in the number of cases of long-COVID. Long-COVID, also known as long-haul COVID, is used to describe symptoms that persist for months or reoccur 4 or more weeks after the initial recovery from coronavirus disease. It could affect people of all ages. Cough, shortness of breath, fatigue, headache, depression, muscle or joint pain, brain fog (difficulty concentrating), insomnia, heart palpitations are some of the common symptoms of long-COVID [4, 5]. Some studies suggest that people with higher body mass index (BMI), Black, Asian and minority ethnicity (BAME), older age, and female gender are more likely to experience symptoms of long-COVID [6]. COVID-19 compromises the functionality of the immune system, putting those with pre-existing conditions including hypertension, cardiovascular disease, and diabetes at a higher risk of dying [7]. People who are critically ill with COVID-19 may experience multiple organ

dysfunction, acute respiratory distress syndrome (ARDS), cardiac arrhythmia, septic shock, liver failure, and heart failure [8].

Although governments around the world are working hard to contain the outbreak by implementing strong containment measures such as lockdowns, social distancing, self-isolation, such a period of public health crisis has serious consequences for human health and wellbeing. Travel restrictions, separation from loved ones, and the fear of an unclear future are all elements that might increase the negative psychological effects [9]. It is also worth mentioning that an increase in substance abuse is projected as a result of increasingly strict policies and may also have repercussions on people's livelihood and wellbeing [10].

The aim of this study is to provide an insight into the impact of the COVID-19 pandemic on people's health and livelihood, as well as learn more about long-COVID and its effect in India, especially after the second wave.

2. MATERIAL AND METHODS

A questionnaire-based research survey was conducted for assessing the impact of the COVID-19 pandemic on health and wellbeing. A questionnaire was structured and circulated randomly using online applications like Whats App and LinkedIn from July 11 2021 to August 1 2021. The questionnaire was designed considering that the respondents were COVID positive people, who were either in recovery phase or had recovered. The questionnaire asked people multiple questions with an intent to assess if they suffered from long COVID-19 symptoms. The survey was kept strictly confidential, anonymous, and solely used for academic research.

2.1. Development of questionnaire

The survey was designed by employing a structured approach that included in-depth literature review and regular group discussions. The survey questionnaire was divided into 7 segments, each containing different sets of questions depending on what the person is selecting in the previous section. The questionnaire contained 26 questions related to the COVID-19 pandemic.

The first segment of the survey inquired about the respondent's socio-demographic statistics, such as gender, age, height, weight, whether they live in an urban or rural area, work status, and if they are vaccinated/unvaccinated. Those who were vaccinated (fully or partially) were then asked the name of vaccine they acquired, and whether they got vaccinated before or after contracting COVID-19, was asked in the second segment of the survey.

The third segment focused on the month and year of recovery from the COVID-19 infection. The participants were asked to state the severity of COVID-19 symptoms, and the symptoms were categorized as mild, moderate, severe, and no symptoms. The participants were also asked if they got hospitalized or were treated at home. Those who were hospitalized were inquired to specify the duration of their hospitalization in the fourth segment.

The fifth segment included questions related to their recovery and the symptoms experienced after the recovery, if any. It was asked that how would they rate their health after recovering from COVID-19, and 5 points Likert scale ranging from 1 (very poor) to 5 (excellent) was used to gauge the response. Multiple choice select options were given to check for the pre-existing comorbidities. An open-ended question was asked to state medications/supplements taken during the recovery from COVID-19. A single choice question was asked to state the physical activeness after recovering from COVID-19. Close-ended questions were asked to evaluate the status of symptoms (persistent symptoms, symptoms reoccurred months after the initial recovery, or no symptoms experienced) and to check its fluctuations.

The sixth segment was focused on the sleeping patterns of the long haulers. Questions regarding sleeping disorders (insomnia, nightmares, sleep apnea, restless leg syndrome, excessive sleepiness, and others) faced by long-COVID patients were asked in the questionnaire. The seventh segment was formulated seeking any other information participants of the survey wanted to share.

2.2. Statistical analysis

All the collected data were statistically analyzed using Microsoft Excel and Jamovi (version 1.1.9) and graphs were plotted using National Center for Education statistic's software. The descriptive and graphical data helped in interpreting the results. Various statistical tests were applied and P-value was observed to accept or reject the null hypothesis. A p-value higher than 0.05 (>0.05) was considered to be not statistically significant and the null hypothesis was accepted.

3. RESULTS AND DISCUSSION

The study aimed to gain insights into the impact of long-COVID on the health and wellbeing of human life, by carrying out a cross-sectional survey of COVID-19 recovered patients. We collected 181 responses

between July 10th and August 1st 2021. COVID-19 infection being multi-factorial, due to a confined number of respondents and insufficient data, all the risk factors and effects may have not been analyzed in the current study. 87.8% of the respondents were of age group 19 to 45, 16% were of age group 45 to 65, and only a few were below 18 (2.2%) and above 65 (1.1%). Respondents were disproportionate of age group 19 to 45 which could increase or decrease our accuracy in assessing the prevalence of long-COVID. It was observed that 53% of the respondents were female. We excluded four respondents in the calculation of BMI due to incomplete information, resulting in a final sample of 177 respondents. During the study it was noted that 56.17% of the individuals had normal BMI, 24.15% of them were overweight, 12.9% were underweight, and 6.17% were obese (fig. 1).

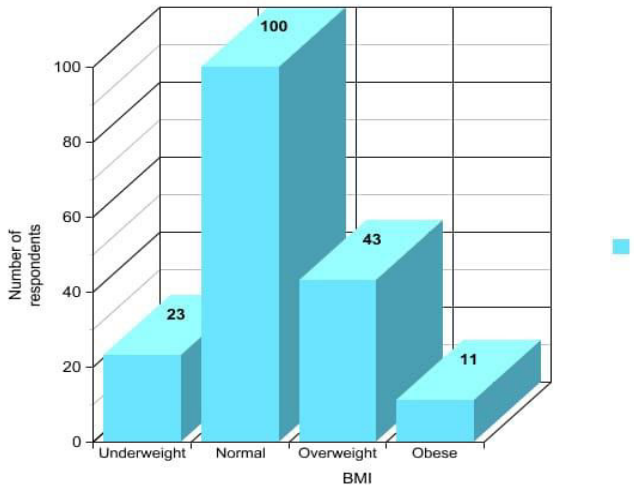

Fig. 1: BMI of the respondents

Fig. 2: Work status of the respondents

It was seen that 85.1% of respondents lived in urban areas, and 37.6% could work from home. 20.4% of the participants could not work from home and many of them (42%) were unemployed/outside the labor force (fig. 2).

3.1. Vaccination status

The respondents were asked to clarify their vaccination status, and 47% of them were not vaccinated when our cross-sectional survey was circulated (i.e., from July 10th, 2021 to August 1st, 2021). It was also seen that 37% were partially vaccinated (i.e., they had received the first dose of the COVID-19 vaccine) and 16% were fully vaccinated (i.e., they had completed a COVID-19 vaccination regimen) (fig 3). It should be noted that fully vaccinated means that the respondents took both doses of vaccination, however, the number of days after 2nd dosage is not known.

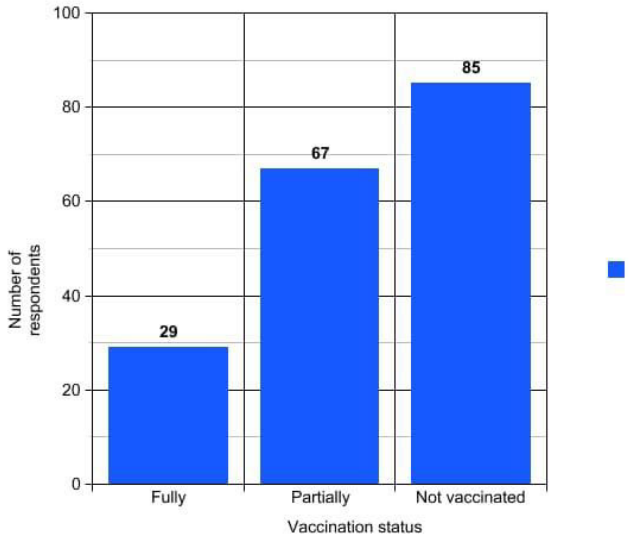

Fig. 3: Vaccination status of the respondents

With an intention to find the most common vaccine that people were inoculated with, the individuals who were partially or fully vaccinated were asked to specify the name of the vaccine they had received. The results indicated that 80.2% of the test population was vaccinated with Covishield, 18.8% with Covaxin, and 1% with Moderna (fig. 4). The next question posed to these individuals was whether they got vaccinated before or after contracting COVID-19 for which 71.9% of the fully/partially vaccinated population responded saying that they got vaccinated after contracting COVID-19. According to a study by the University of Arizona Health Sciences, individuals who contract COVID-19

after getting vaccinated are more likely to have a lower viral load, a shorter sickness time, and milder symptoms [11]. We found a significant difference in recovery rate in individuals who got vaccinated before contracting COVID-19 and individuals who got vaccinated after contracting COVID-19 (Chi-squared test, p=0.005). Thus, reaffirming the previous study, however more in-depth study would be needed.

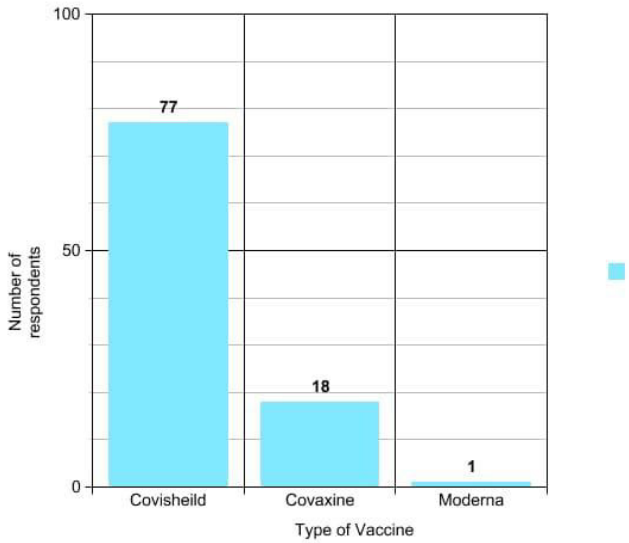

Fig. 4: Statistics of type of COVID-19 vaccine received by the respondents

3.2. Severity of COVID-19 symptoms

Most of the respondents (i.e., 43.6%) experienced mild symptoms when they were infected with COVID-19. Mild symptoms could be defined as runny nose, low fever, cough, fatigue, headache, and loss of taste and smell [12]. Moderate symptoms were experienced by 32% of the respondents, and moderate symptoms could be defined as fever above 100.4°F, cough, fatigue, muscle pain, and dyspnea [12]. The statistics of asymptomatic individuals and individuals with severe symptoms was 16.6% and 7.7%, respectively. Severe symptoms could be defined as fever above 100.4°F, dyspnea without exerting yourself, hypoxia, confusion, chest discomfort, gastrointestinal symptoms such as diarrhea and vomiting, dehydration, rhabdomyolysis, and coagulation disorder [12]. The definitions of different levels of symptoms were presented to the respondents in the survey form. It should be noted that the definition for the severity of symptoms could vary from person to person, and not everyone will experience all the symptoms mentioned above. It was observed that 94.5% of the respondents were not hospitalized during their course of infection. The duration of hospitalization for the rest of the respondents (i.e., 5.5%) varied from less than a week to more than one month.

3.3. Recovery from COVID-19

Respondents were asked to rate their health after recovering from COVID-19 on a five-point scale ranging from 'very bad' (1) to 'excellent' (5). Most of the respondents were in good health (40.3%) or excellent health (38.7%), 16% were feeling neither good nor bad, and 4.4% were in bad health. The number of individuals who had recovered from COVID-19, amongst the test population was high in the months of May 2020 (20.4%), May 2021 (17.1%) and April 2021 (15.5%), which correlated with the high rate of infection during these months. The study indicated that BMI of an individual (Kruskal-Wallis test, p=0.029) and the severity of symptoms (One-way ANOVA, p=0.015), affected post-COVID health (after recovery) of the respondents. All those who were asymptomatic exhibited the best recovery rate, and those who had mild symptoms displayed a better recovery rate than those who had moderate and severe symptoms.

According to (Kang and Kong, 2021), people with BMI < 18.5 kg/m2 and BMI ≥ 25 kg/m2 are at a higher risk for severe COVID-19 than people with normal BMI [13]. Similar results were found in our study. However, how the BMI affects the recovery rate and symptom severity is not known.

In the previous study by (Davis et al., 2021), brain fog, fatigue, insomnia, headache, shortness of breath, heart palpitations were some of the common symptoms associated with long-COVID [14], similar observations were noted in our study. Most of the respondents (48.6%) did not experience any long-COVID symptoms after recovering from COVID-19 infection. However, most of the respondents who were classified as COVID-19 long-haulers experienced fatigue (30.4%), anxiety or depression (20.4%), headache (19.3%), joint or muscle pain (18.8%), brain fog (14.9%), cough (11.6%), shortness of breath (6.6%), chest pain (6.1%), sense distortion (5%), and numbness (pins and needles, 4.4%). Interestingly, hair fall was also reported by few participants and a previous study suggests that hair fall is one of the common post-COVID symptoms [15].

The majority of the respondents (80.7%) did not have any pre-existing diseases, this may be due to the factor that the majority of respondents were in age group of 18-45 years. However, those who did, reported that

they were suffering from hypertension (6.1%) and obesity (5.5%). As per previous studies, asthma was the only pre-existing condition significantly associated with long-COVID [16]. Since, most of the respondents did not have any pre-existing disease, the test population under consideration in the survey provided limited scope to find any relation between pre-existing diseases and recovery rate. Few individuals had reported that they were suffering from PCOS, and a previous study suggested that certain factors that are common in women with PCOS such as, low vitamin D levels, hyper-inflammation, hyperandrogenism, increases the risk of severe COVID-19 [17]. Hence, this aspect should not be ignored and further studies can be done to establish a correlation. For 35.3% of the respondents, long-COVID symptoms were persistent or reoccurred four or more weeks after the initial recovery from coronavirus infection. For 22.7% of respondents, symptoms changed over time, 19.3% of respondents said that their symptoms varied from day to day, and 14.4% of respondents reported that their symptoms did not fluctuate at all.

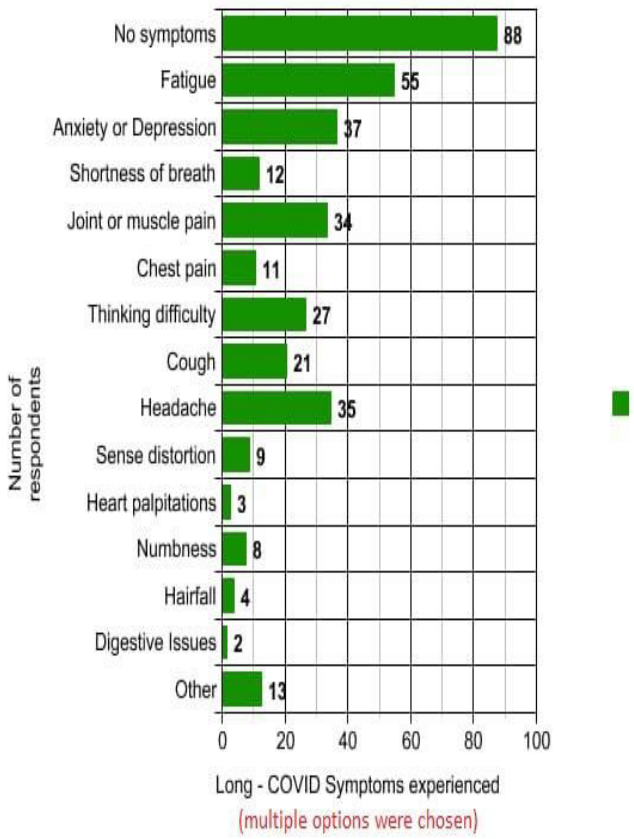

Fig. 5: Long-COVID symptoms experienced by the respondents

Vitamin C and zinc supplements were the most common type of over-the-counter supplements taken by the respondents, during the recovery phase. A healthy diet (86.7%), adequate sleep (74.6%), drinking plenty of water (70.2%), yoga or/and meditation (28.2%), and light exercises (27.1%) were some of the steps that helped respondents in recovering from COVID-19 (fig 6).

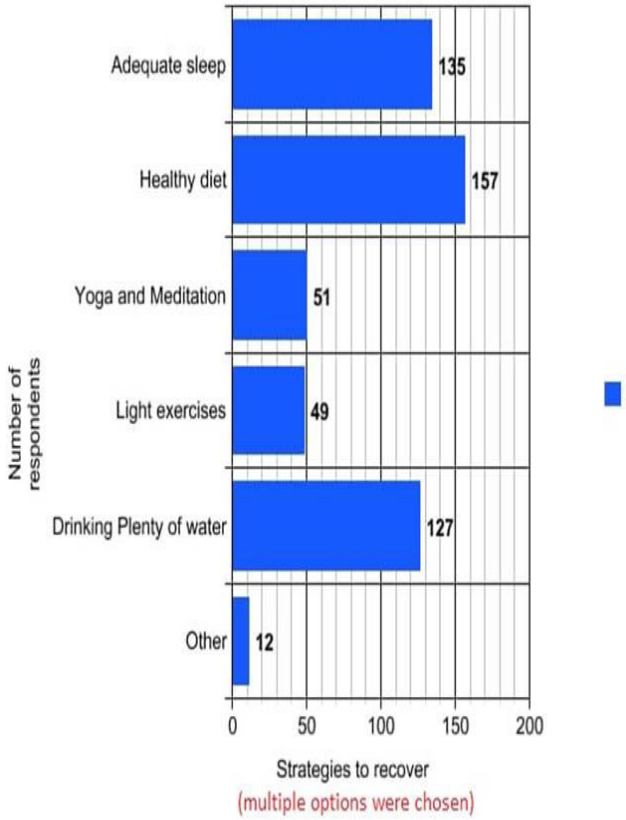

Fig. 6: Interventions that aided the respondents in recovery from COVID-19 infection

3.4. Changes observed post-recovery

The current study also evaluated the impact of COVID-19 infection on the respondents after they were assumed to have recovered. The respondents were asked to specify how physically active they were after recovering from COVID-19, and it was observed that 43.1% of the people were lightly active, and about 32% were moderately active, whereas 12.7% were not physically active, and only 12.2% carried out rigorous physical activity. The current study indicated that the COVID-19 pandemic impacted mental health of individuals in test population [18]. Anxiety and depression were the most common type of mental disorders seen in our study. According to our study, the COVID-19

pandemic also impacted people's work-life balance and similar results were also noted in previously reported studies [14]. It was seen that COVID-19 has impacted people's mental health (47%), work-life balance (34.3%), and dietary patterns (26.5%) (fig 7).

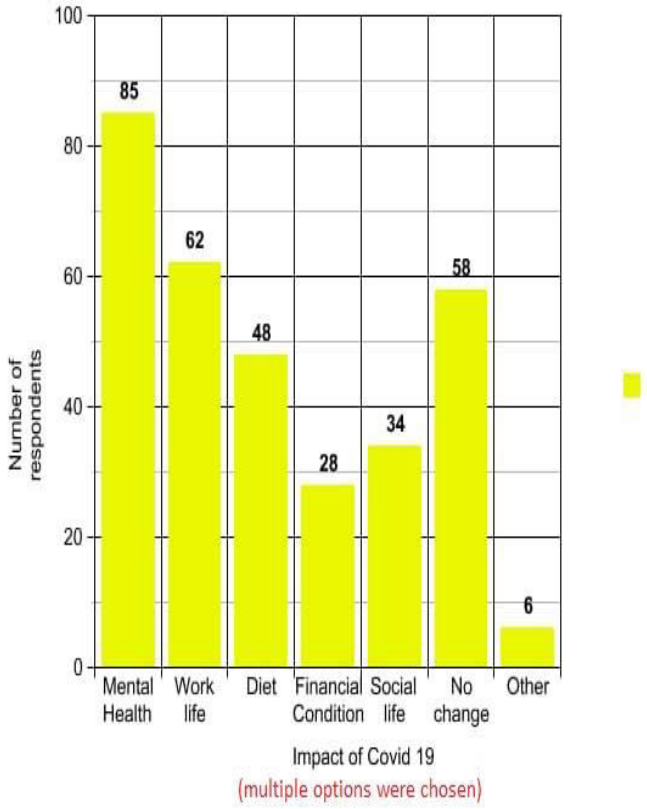

Fig. 7: Various parameters of life that were impacted by COVID-19 infection

In a previous study, neurologists specialized in sleep disorders had observed an increase in sleep disorders like insomnia and hypersomnia associated with COVID-19, and termed it as "COVID-somnia" [19]. The current study highlighted that 19.3% of the respondents were having trouble sleeping after recovering from COVID-19. Insomnia was the most common type of sleep disorder experienced by these people. Symptoms like restless leg syndrome and excessive sleepiness were also experienced by few people. In our study, it was found that having sleep disorders can affect the recovery rate of a COVID-19 patient (Chi-squared test, $p = 0.002$).

4. CONCLUSION

The present study thus indicated that the severity of symptoms depends on whether the individual is partially/fully vaccinated, or not vaccinated at all. The recovery period is affected by the BMI of individuals, their sleeping patterns, and the severity of their symptoms. COVID recovered patients may experience fatigue, headache, and muscle pain. These symptoms could persist, reoccur after initial recovery, may change over time or not change at all. The study also helped in emphasizing about certain elements that COVID-19 could affect, like an individual's mental health, their work-life and sleep problems like insomnia. The current study was carried out with an intention to obtain a first-hand information on the risk factors and long-term impact of COVID-19 on various aspects of people's life in India. The results obtained may form a strong foundation and indicators for future studies. Further prospective studies on the impact of COVID-19 on health and wellbeing may benefit by taking into account the various factors evaluated in the current study.

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Conflict of interest

The authors declare that they have no competing interests with whomsoever.

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