

Study of Post-COVID-19 Health Complications Among Recovered Patients

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ABSTRACT

Coronaviruses are enveloped positive-sense single-stranded RNA viruses. A novel virus named as 2019-nCoV, originated in Wuhan city of China. Coronaviruses are members of the family Coronaviridae, that infect humans as well as animals. The new coronavirus before not been described in humans developed in Wuhan, China in December 2019. COVID-19 pandemic influencing all over the world humans since at end of 2019. The Post-COVID syndrome was described in the framework of a survey of long COVID-19 symptoms. Several reports from many portions of the world have exposed that COVID-19 has various long-standing effects on nearly all systems such as neurological, respiratory, psychiatric, cardiovascular, gastrointestinal as well as dermatological systems.

Keywords: - COVID-19, post-infectious, complications, long-term.

INTRODUCTION

Coronaviruses are members of the family Coronaviridae, that infect humans as well as animals [1]. Coronaviruses may cause diseases identical to a common cold, although another's can cause highly serious diseases (like MERS including SARS) [2]. The new coronavirus before not been described in humans developed in Wuhan, China in December 2019. On 31 December 2019, the WHO China Country Office was informed of cases of pneumonia of unknown etiology identified in Wuhan City, Hubei Province of China [3]. Since 8 December 2019, cases had been described including various patients who worked or resided on all sides of the regional Huanan Seafood Market despite another initial case having no disclosure to the market [4]. On January 7, a novel coronavirus was identified from a throat swab sample of the patient formerly concise as 2019-nCoV through WHO [5]. That pathogen was renamed SARS-CoV-2 by the coronavirus analysis team with the infection designated COVID-19 Up to January 30th, 7736 were affirmed with 12,167 suspicious cases having been described in China with 82 confirmed cases identified in 18 other countries [6]. As stated by China's National Health Commission, the death percentage between affirmed cases in China was 2.1 percent as of February 4 including a mortality amount was 0.2 percent between cases exterior China. In the patients admitted to hospitals, the death proportion ranged from 11% as well as 15%. COVID-19 is a disease with an almost large death rate, although the details accessible in people's reports with the published article are vastly rising [7]. COVID-19 pandemic influencing worldwide humans since at last of 2019. While the serious route of disease has occurred worry since the start of the pandemic period has proceeded aspect of various post-recovery appearance proceeding stayer takes became another reason for distressed [8]. Several cases from many portions of the globe that were exposed to COVID-19 have several long-standing effects on nearly entire systems involving respiratory, psychiatric, gastrointestinal, cardiovascular, neurological, as well as dermatological systems. A substantial portion of patients, up to 87.5%, improving from acute disease proceeds to endure various kinds of symptoms like myalgia, fatigue as well as headache. The information that persons who have a slight sickness or no symptoms in acute disease endure from long-period indications shows that infection occurs larger harm than show in diseased people. In the present study, a random survey was conducted to identify the status of post-COVID health problems after recovery from the disease [9].

MATERIALS AND METHODS

Study design and participants

A current study was carried out by doing a random survey of thousands of people who recovered from COVID - 19, in the vicinity of Kopergaon Taluka from the state of Maharashtra in India. The prospective study was conducted for patients that get better from COVID- 19 during the first and second waves. Participants in the study were chosen in a way that they have had COVID for at least 3 months. The particular questionnaire was designed to ask about the present health condition of patients including their constant symptoms in a post-COVID time. The main motive behind the survey was to examine whether people are still having any health complications after recovery from COVID-19. The questionnaire was completed by skilled microbiology students through direct conversations. In the beginning, people were asked to be involved in the study. If they accept, later verbal accord questions in the study were directed to them [10].

Content of the survey

The content of the survey was comorbid diseases, age, sex, features of acute COVID-19, history of medical hospitalization (disease seriousness, period of stay of patients in hospital, the requirement for respiratory aid, including the requirement for ICU, the period since symptoms start, the occurrence of constant symptoms through systems. Information about acute COVID-19 was obtained from participants on their own [11]. Acute COVID-19 consequence for patients was noted as minor to modest, serious, as well as dangerous infection depending on the WHO COVID-19 practical rules. A time of the disease was determined from the initial COVID-19 analysis up to the time of slightly 3 months later retrieval would be accepted to evade misperception about terminology [12]. The symptoms of patients are divided into distinct groups general (myalgia as well as weight reduction), cardiovascular (palpitation), dermatologic (loss of hair including rash), neuropsychiatric (nightmare, insomnia, headache), gastrointestinal (abdominal discomfort, dysentery, as well as constipation), respiratory (pain in the chest, cough, including wheezing) as well as genitourinary systems (urinary incontinence). The symptoms mentioned above were evaluated by asking simple yes or no without any score, further general disease severity was measured as mild to moderate and severe. Further, the prime concern behind the study was to find out the peoples who recovered from the COVID – 19 but had health complications for a longer period [13].

RESULT AND DISCUSSION

Table-1: Age group-wise classification of participants

Age groups	Male	Female	Total
0 – 25	52 (5.18%)	196 (19.54 %)	248 (24.72%)
26 – 40	73 (7.27%)	163 (16.25%)	236 (23.52%)
41 – 60	132 (13.16%)	122 (12.16%)	254 (25.32%)
61 – 80	145 (5.18%)	106 (10.56%)	251 (25.02%)
81 – 100	12 (1.19%)	2 (0.19%)	14 (1.39%)

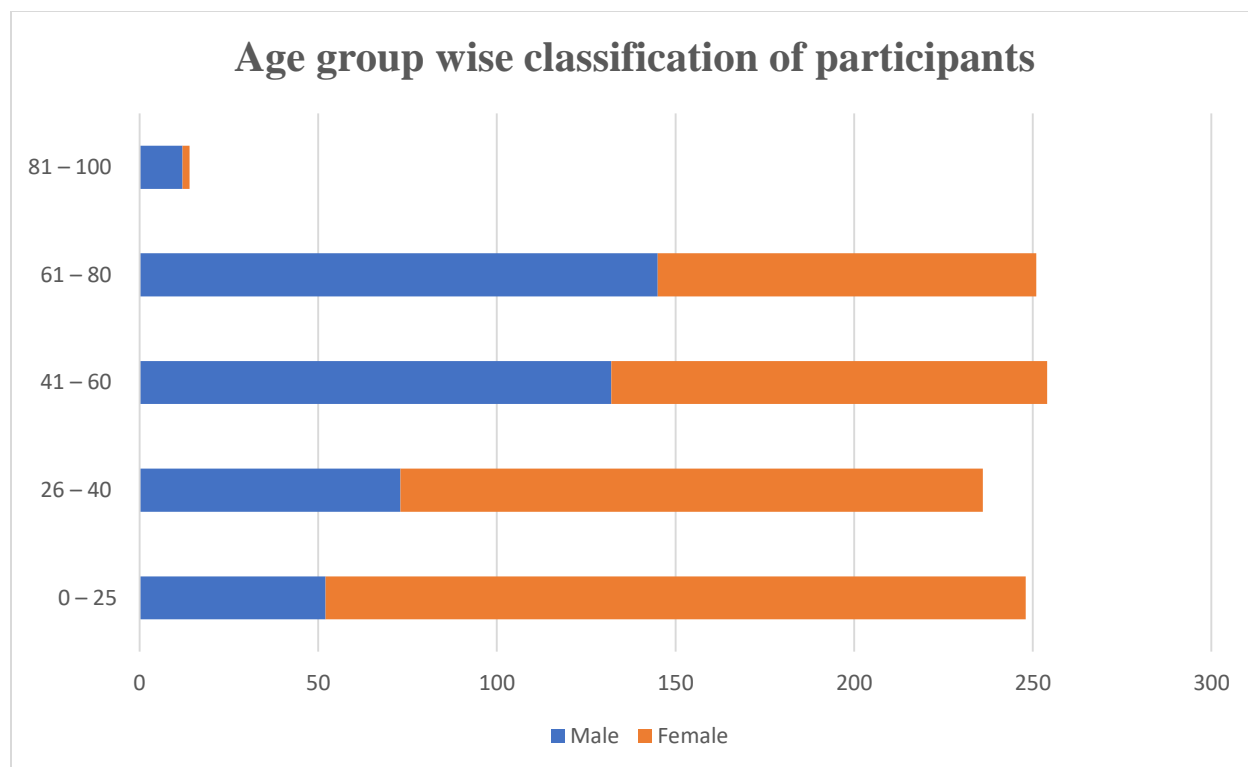


Fig- 1: Age group-wise classification of participants

During the duration of the study, 1003 people who recovered from COVID-19 were questioned if they agree to be involved in the study, and all of that was agreed to respond to the survey. The survey was achieved through an entire amount of 1003 participants. All the participants in the survey were first categorized into different age groups. Further within the age group males and females were separately grouped. The first age group was between 0-25 years. This group includes a total of 248 (24.72%) participants which included 52 (5.18%) males and 196 (19.54 %) females. The second group was between 26 – 40 years which included males 73 (7.27%), females 163 (16.25%) total of 236 (23.52%) participants. The third group belongs to people of age group 41 – 60 years which included a total of 254 (25.32%) participants out of which 132 (13.16%) were males and 122 (12.16%) were females. Another age group was between 61 – 80 years which included 145 (5.18%) males as well as 106 (10.56%) females so a total of 251 (25.02%) participants. The last group was between 81 – 100 years from which 12 (1.19%) were males and 2 (0.19%) were females so the total participants of the group were 14 (1.39%). (Table:1, Fig:1) [14].

Table- 2: COVID – Occurrence during different waves

Gender	1 Wave	2 Wave	Both waves	Total
Male	109 (10.86%)	303 (30.20%)	3	412 (41.07%)
Female	120 (11.96%)	475 (47.35%)	1	595 (59.32%)

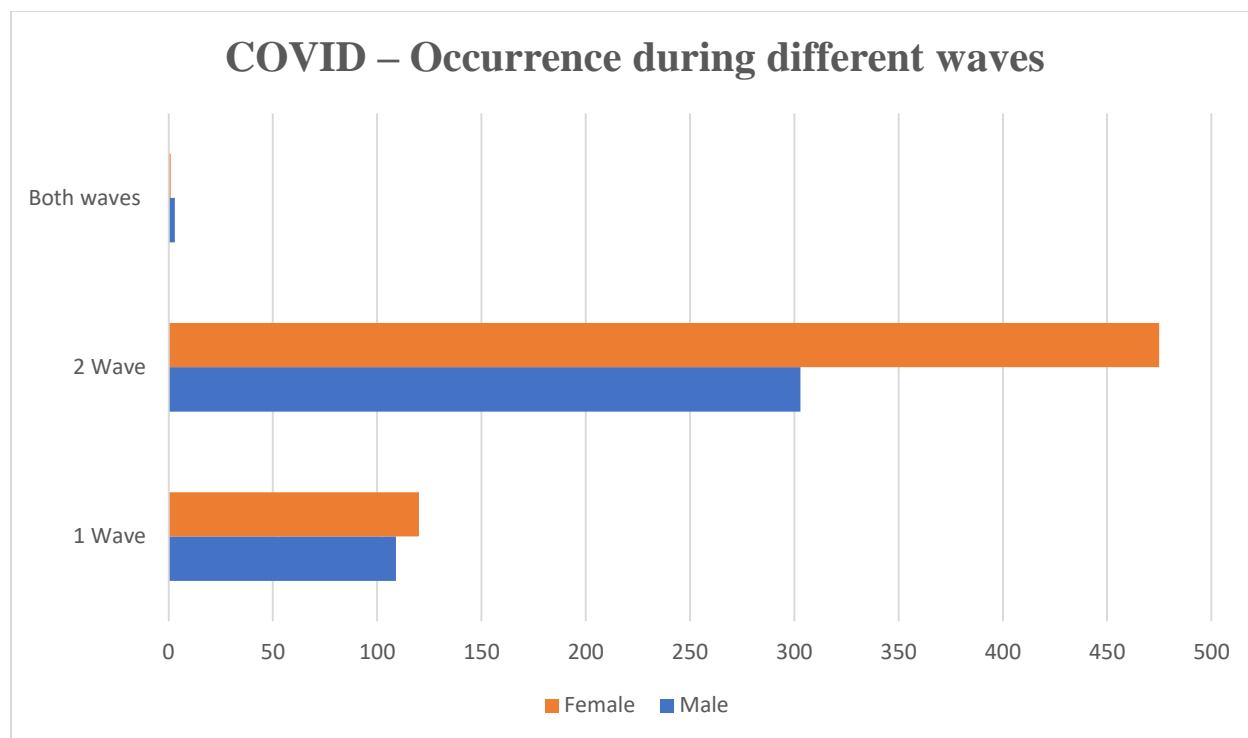


Fig-2: COVID – Occurrence during different waves

Further, all participants were categorized based on the occurrence of COVID -19 in the first as well as second waves. As per the analysis of data, it was found that 229 people were affected during the first wave, out of which 109 (10.86%) were males and 120 (11.96%) were females. As compared to the first wave majority of participants were affected during the second wave. A total of 778 people were affected during the second wave which included 475 (47.35%) females and 303 (30.20%) males around 4 participants were found affected in both waves. From this data, it can be concluded that the infection rate of the virus in the second wave was high in comparison to the first wave [15].

Table-3: Vaccination status

Gender	Before vaccination	After vaccination		Total
		1Shot	2 Shot	
Male	408 (40.67%)	2 (0.19%)	NIL	410 (40.87%)
Female	591 (58.92%)	2 (0.19%)	NIL	593 (59.12%)

Vaccination is important to control viral pandemics since the time so many viral diseases were successfully controlled by vaccination like polio, smallpox, chicken pox, etc. during COVID- 19 also vaccination played important role in controlling pandemics, as no choice of proper drugs was available to control the virus, here vaccination status of participants were also checked, it was found that almost all participants were affected from the disease before vaccination, which included 408 (40.67%) males and 591 (58.92%) females. Very few participants have been affected after the first shot of the vaccine. From the above data, it can be concluded that vaccination has boosted the immune system in the majority of participants.

Table- 4: Disease severity during COVID – 19

Gender	Mild – Moderate	Severe	Critical	Total
Male	236 (23.52%)	154 (15.35%)	20 (1.99%)	410 (40.87%)
Female	591 (58.92%)	591 (58.92%)	7 (0.69%)	593 (59.12%)

The collected data were also analyzed for disease severity during COVID – 19 among participants. overall participants were categorized into three different categories Mild – moderate which included patients having mild-moderate symptoms. This category included a total of 827 patients out of which 236 (23.52%) were males and 591 (58.92%) were females [16].

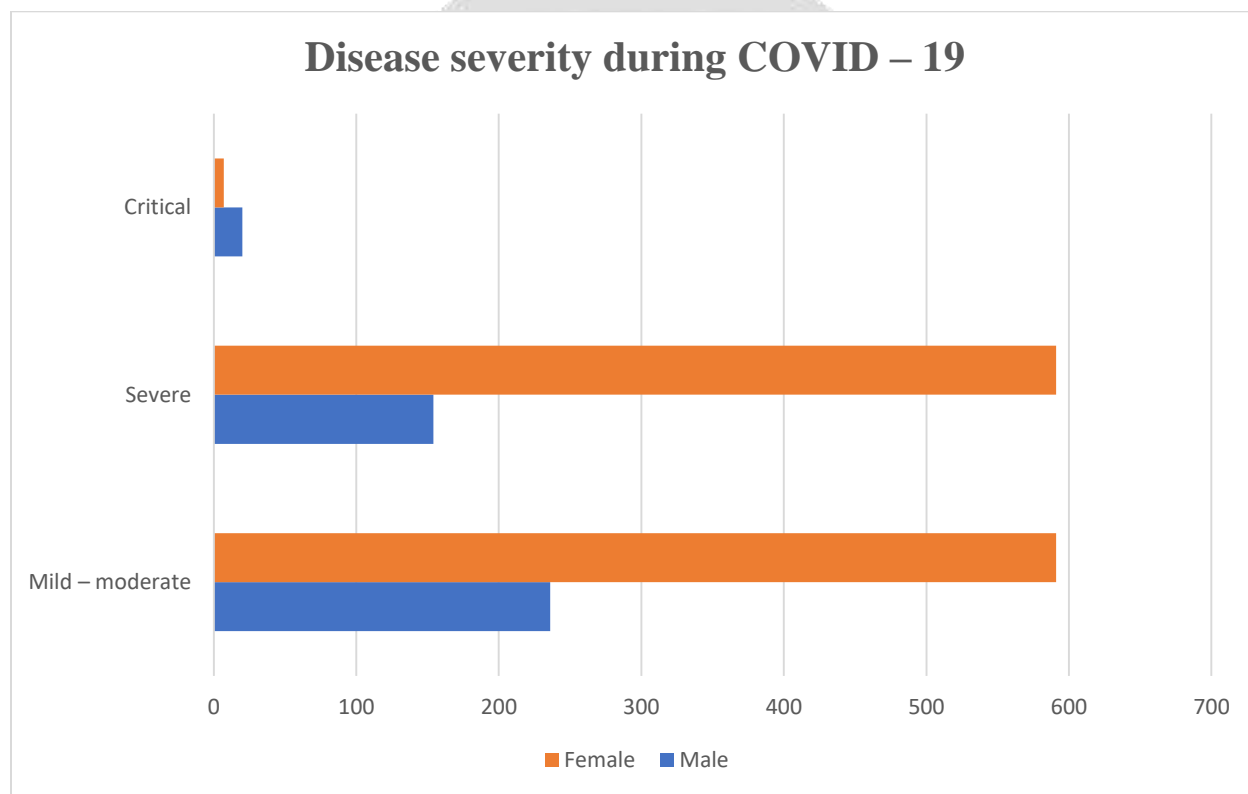


Fig- 3: Disease severity during COVID – 19

Table-5: Remdesivir dependencies for the treatment

Gender	Yes	No	Total
Male	12 (1.19%)	399 (39.78%)	411 (40.97%)
Female	9 (0.89%)	583 (58.12%)	592 (59.02%)

Remdesivir was found to be the effective drug of choice for the treatment of severe patients. As per WHO remdesivir was included in a choice of drug for the treatment of severe cases. The collected data of participants were also analyzed for remdesivir dependency. As in most of the cases, it was found that patients administered remdesivir after recovery suffered from side effects. And in most of the cases, post-COVID effects were induced due to

remdesivir. As per the data very less no of participants needed remdesivir. It included 12 (1.19%) males and 9 (0.89%) females. The majority of participants were not found to depend upon remdesivir [17].

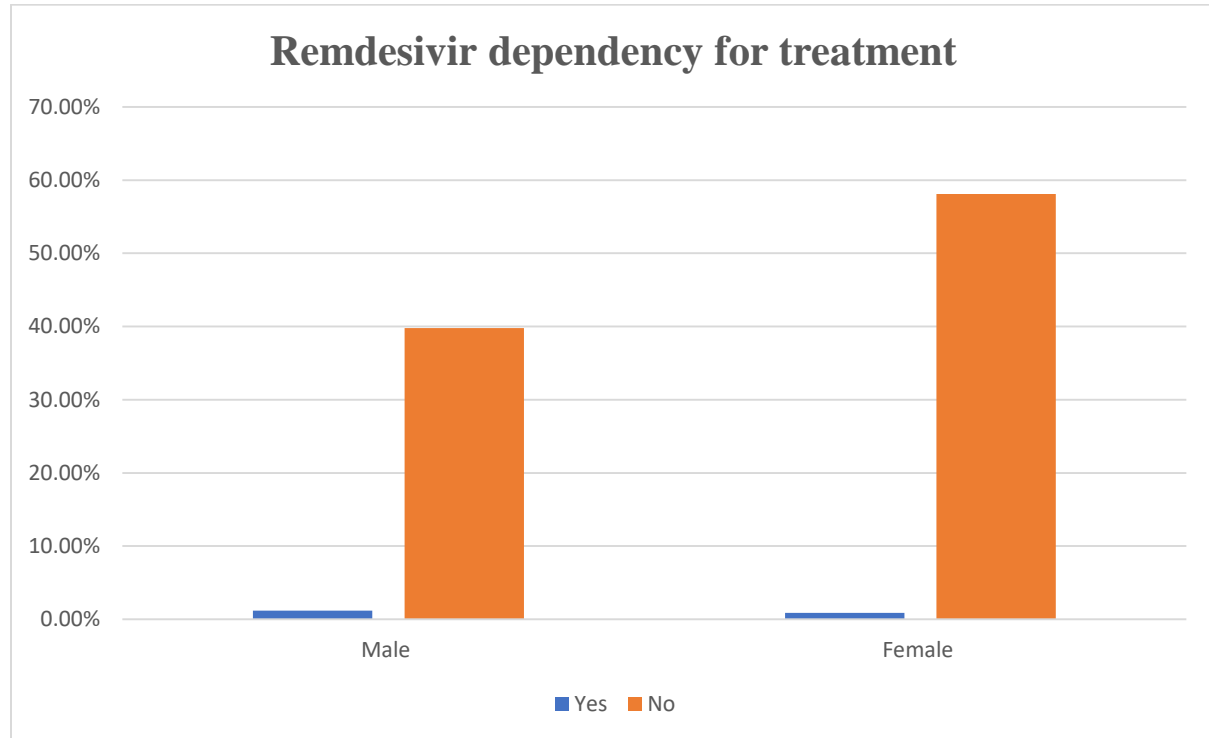


Fig-4: Remdesivir dependencies for the treatment

Table-6: Status of respiratory support during the course of the disease

Gender	Yes	No	Total
Male	70 (6.97%)	342 (34.09%)	412 (41.07%)
Female	74 (58.92%)	517 (51.54%)	591 (58.98%)

As the prime target for the virus is the respiratory system, most of the severe category of patients needed respiratory support. As per the analyzed data, it was found that around 70 (6.97%) and 74 (58.92%) needed respiratory support. And most of the participants needed artificial respiration.

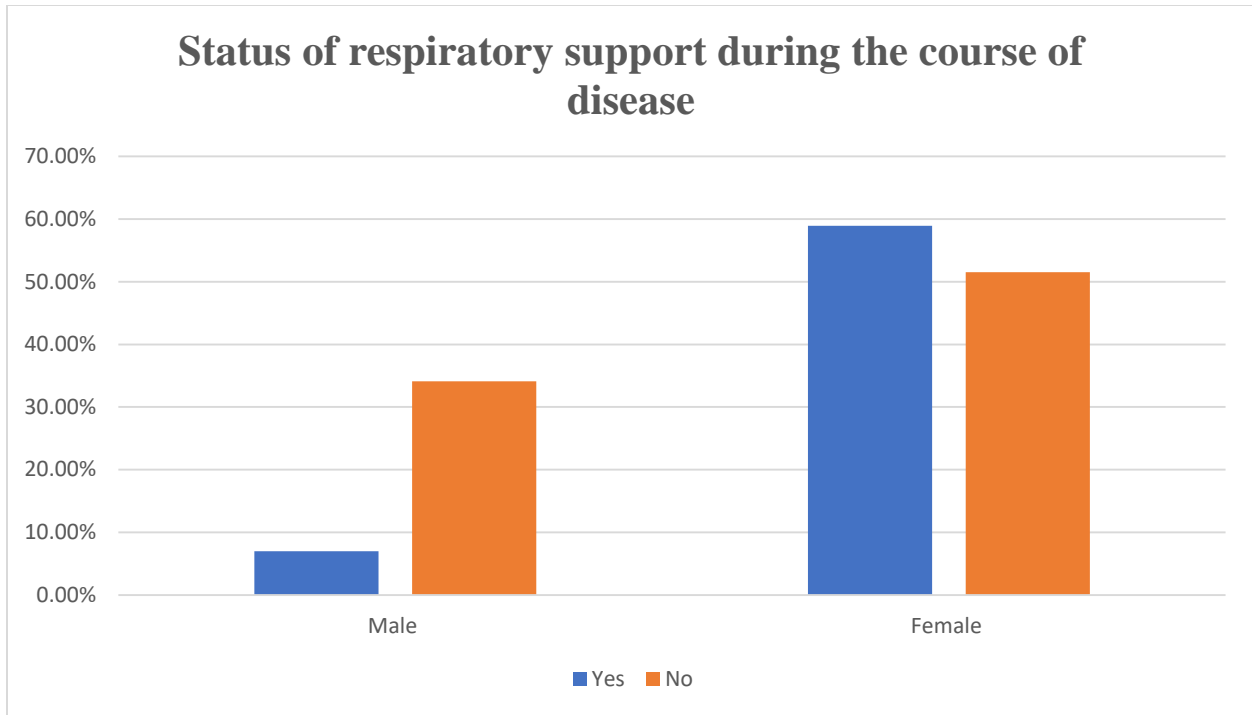


Fig-5: Status of respiratory support during the course of the disease

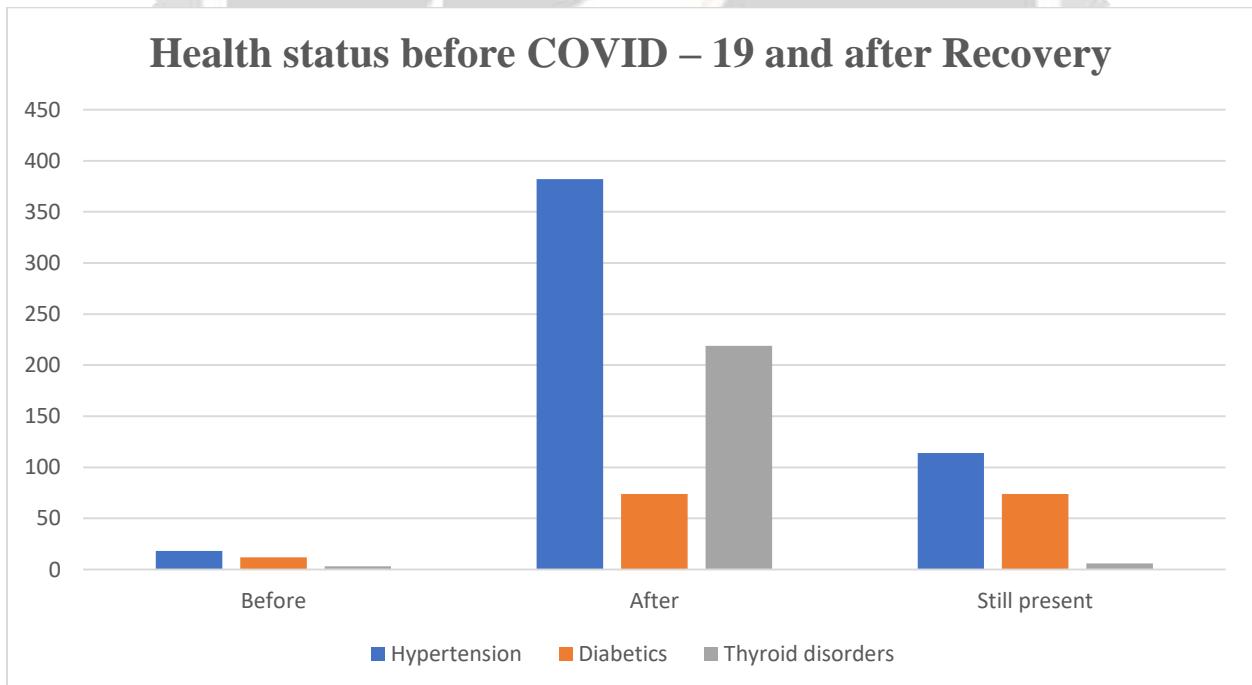


Fig-6: Health status before and after COVID – 19

Table-7: Health status before and after COVID – 19

Health status before COVID – 19 and after Recovery			
Disability	Before	After	Still present
Hypertension	18	382 (38.8%)	114 (11.36%)
Diabetics	12	74 (7.37%)	74 (7.37%)
Thyroid disorders	3	219 (21.83%)	6 (0.59%)
Weight loss	9	388 (58.92%)	41 (1.39%)
Fatigue	4	393 (39.18%)	30 (2.99%)
Insomnia	-	171 (17.4%)	2 (0.19%)
Loss of appetite	5	325 (58.92%)	56 (5.58%)
Constipation	3	83 (8.27%)	1 (0.09%)
Diarrhea	4	51 (5.08%)	3 (0.29%)
Loss of taste	20	320 (58.92%)	15 (1.49%)
Loss of smell	21	232 (23.13%)	6 (0.59%)
Hair loss	22	85 (8.47%)	29 (2.89%)
Depression	31	249 (24.82%)	13 (1.29%)
Anxiety	6	216 (21.53%)	31 (3.09%)
Others	28	216 (58.92%)	31 (3.09%)

The main focus of the study was to find out various health complications among the patients who recovered from COVID-19. The majority of people from different areas and different age groups have been suffering from minor to major health complications, this condition is defined long COVID and Post COVID syndrome. These health complications continued for short period after recovery and in many cases persisted for a longer period and become a permanent disability. The majority of participants started with disabilities like Hypertension, Diabetics, Thyroid disorders, Loss of taste, Loss of smell, Fatigue, etc. People suffering from these health issues were classified into three different categories disability appeared before COVID-19 and After recovery and a third category is still present i.e., long COVID [18]. As per as major disabilities are concerned around 382 (38.8%) people have started the problem of hypertension out of 382 (38.8%), 114 (11.36%) still have the problem 268 participants suffered from acute hypertension. Further in 74 (7.37%) peoples diabetics was induced after recovery and the disease continue among all 74 (7.37%) people. Then around 219 (21.83%) suffered from thyroid disorders for a short period most of them recovered from the problem and very few i.e., 6 (0.59%) continued with thyroid disorders that are still present [19]. Further, a common problem found among the majority of persons was a loss of taste as well as smell. In the course of the infection and after recovery also almost every individual who was infected with COVID-19 complained about the loss of smell and test [20]. In the current survey, it is found that 320 (58.92%) and 232 (23.13%) participants suffered from the loss of smell and test respectively during the disease and after recovery from the disease [21]. Most of them recovered from this problem and few participants continued with the problem of loss of smell and test. Besides these majority of the people suffer from anxiety and depression during the disease [22]. A further major issue during the course was the loss of appetite, weight loss, and fatigue among several participants on average 300 participants complained about this. Another issue was constipation and diarrhea seen among a small

group of participants and around 216 (58.92%) people suffering from other disabilities [23]. The major concern is with participants suffering from hypertension and diabetes. This may induce due to drugs used for treatment or may be due to decreased immunity during the disease further need more technical data analysis as well data from clinical trials [24].

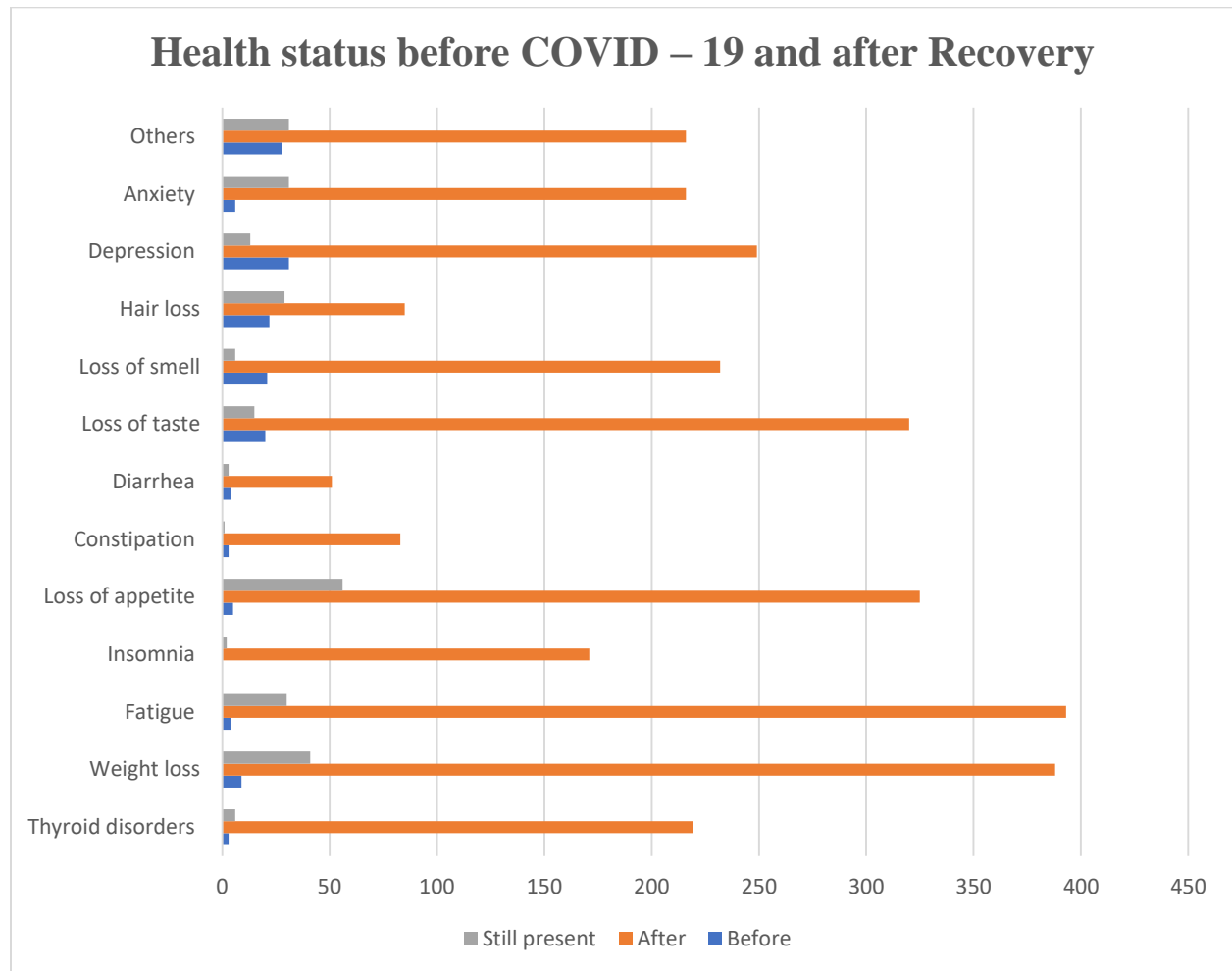


Fig-7: Health status before and after COVID – 19

CONCLUSIONS

The results displayed that a significant portion of patients with COVID-19 had continual symptoms even 4–5 months later the COVID-19 examination, as well as patients with minor-to-modest infection, suffered from continual symptoms. certain patients visited the outpatient clinics, mostly for respiratory as well as cardiovascular symptoms, though, patients with neuropsychiatric symptoms were unnoticed that symptoms were probably because of a lack of information about symptoms. While the continual symptoms of the patients are not crucial, follow-up of those symptoms in the post-recovery time is essential because of the subsequent interruption of life eminence. Patients should be informed regarding the long-period consequence of COVID-19 including the perception regarding post-recovery follow-up should be elevated. The proper assessment of the persons in the post-recovery time can give their way to the pertinent clinics as well as well supervision for recovery. In total, COVID-19 is distinct from classical respiratory infections along with needed complete monitoring, and even later recovery. During post-COVID time, health care can strategic as integrative care to report the patient as an entire.

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