Faculty of Medicine

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Characteristics of Long Covid Symptoms of People Affected by COVID-19 living at Savar Upazila, Dhaka, Bangladesh.

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Bachelor of Science in Physiotherapy (B. Sc. in PT)

DU Roll No:830

Registration No:6900

Session: 2016 – 2017

BHPI, CRP, Savar, Dhaka

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We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for acceptance this dissertation entitled

Characteristics of Long COVID Symptoms of People Affected by COVID-19 living at Savar Upazila, Dhaka, Bangladesh.

Submitted by **Tamzid Hossain** for the partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B. Sc. in PT)

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Name of the student: **Date:**

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LIST OF ABBREVIATIONS OR SYMBOLS

BHPI	Bangladesh Health Professions Institute
CRP	Centre for the Rehabilitation of the Paralysed
DU	University of Dhaka
COVID-19	Coronavirus Disease - 2019
MBPI	Modified brief pain inventory
MBFI	Modified brief fatigue inventory
ICU	Intensive Care Unit
Sars-Cov-2	Severe Acute Respiratory Syndrome Coronavirus 2
ARDS	Acute Respiratory Distress Syndrome
MERS	Middle East Respiratory Disease
WHO	World Health Organization
AR	Attack Rate
CI	Confidence interval
ICD	International Classification of Diseases
SPSS	Statistical Package for the Social Sciences
BMRC	Bangladesh Medical Research Council
IRB	Institution Review Board
CPS	Clicks Per Second

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ABSTRACT

Background: The objective of this study was to identify the Characteristics of long COVID symptom and Explore the relation among long COVID symptoms and socio demographic variables and explore the level of impact on peoples life due to long covid symptoms. **Method:** A prospective survey was undertaken of cross sectional study to confirmed people living with and affected by long COVID (aged 18–87 years). 294 participants were recruited from across savar upazila, Bangladesh. All participants had a previously confirmed positive COVID-19 diagnosis and passes at least 12 weeks are reported persistent symptoms and difficulties in performing daily activities. Participants who consented were contacted by face-to-face interview. MBPI and MBFI scale were usesd to measure the severity of pain and fatigue. **Result:** Among 294 participants, the prevalence of long COVID symptoms at 12 weeks was 15.6%. Association in between gender and modified brief fatigue inventory are noticed. Female are more probability to effected than male to fatigue . Also association in between comorbidities and modified brief pain inventory are noticed. Who has more co-morbidities , he/ she is more risky to affected by long COVID pain symptom. **Conclusion:** In this study, the prevalence of long COVID symptoms was 15.6%. this study also describe the characteristics of the symptom and association with gender and co-morbidities.

Key words: COVID-19, long COVID, post-COVID-19 syndrome, Characteristics, Symptom ,post-acute sequelae of SARS-CoV-2 infection.

Word Counts:10887

CHAPTER 1 INTRODUCTION

BACKGROUND

Corona virus disease (COVID-19) is an infectious disease caused by the Sars Cov-2 virus. Acute respiratory syndrome with severe symptoms SARS-CoV-2 is the seventh coronavirus to infect people since the SARS and Middle East Respiratory Syndrome (MERS) viruses were discovered in this century. It was first diagnosed in December 2019 in Wuhan, China. The lack of pre-virus immunity has resulted in an exponential growth in infected people globally, making the pandemic one of the most serious health threats humanity has faced in the previous century. (Sisó-Almirall et al., 2020)

The coronavirus disease 2019 (COVID-19) outbreak infected a large portion of Europe from March to May 2020.The REVA network created a specific registry (COVID-ICU) to prospectively collect characteristics, management, and outcomes of patients admitted to intensive care units (ICUs) in France, Belgium, and Switzerland for severe COVID-19. As of October 1st, 2020, 395,104 people in France had tested positive with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and 32,365 people had died as a result of the sickness. The number of COVID-19 patients admitted to French ICUs peaked at 7148 on April 8, 2020.(Schmidt et al.,2021).

In March 2020, the coronavirus was discovered to have spread to Bangladesh. The country's Institute of Epidemiology, Disease Control, and Research(IEDCR) reported the first three cases on March 8, 2020. Two guys who had lately returned from Italy, as well as a female relative, were among them (Shammi et al.,2021). Since then, the pandemic has spread over the entire country, with the number of persons affected steadily increasing. After India, Bangladesh is the second most afflicted country in South Asia. Bangladesh announced its first coronavirus death on March 18. In the entire country, 53 % are affected in Dhaka district, with 65 % in Dhaka City. Savar Upazila is a part of Dhaka City that connects the Dhaka-Aricha (N5) National and Prominent Highway. The first coronavirus case in Savar Upazila was confirmed on April 14, 2020. (Hafsa et al. , 2020).

Corona virus disease is a infectious disease. The majority of those infected with COVID-19 virus will have mild to moderate respiratory symptoms and will recover without the need for therapy. Some, on the other hand, will become extremely unwell and require medical attention. People who are older or who have underlying medical diseases such as disorder, diabetes, chronic lung disease, or cancer are more susceptible to acquire serious sickness. COVID-19 can make anyone sick and cause serious illness or death at any age.

SARS-continued Cov-2's spread is a public health emergency of international significance, resulting in a massive global disease burden. More than 200 million COVID-19 cases have been confirmed worldwide as of early August 2021, and more than 4.3 million people have perished as a result of Sars-cov-2 infection. (Sharma et al,2020)

The rapid and unpredictable global spread of SARS-CoV-2 appears to have been linked to cases imported from the key countries affected, with most infected people showing no or just moderate symptoms. (Sisó-Almirall et al., 2021). The clinical spectrum of SARS-CoV-2 is extremely extensive. Mild respiratory infection and, less commonly, pneumonia with fever, cough, and dyspnea are the most prevalent clinical presentations of COVID-19 (Connors et al.,2020)

Symptoms following acute COVID-19 recovery have been extensively reported and have been a growing source of concern. In a previous cohort study, about three-quarters of COVID-19 survivors discharged from hospital still had persistent symptoms, and patients who were critically ill during their hospital stay had a higher risk of lung diffusion impairment and radiographic abnormality than those with less severe disease. (Huang et al., 2021)

COVID-19 has far-reaching consequences that go beyond acute illness and hospitalization. Several studies have found that 1–3 months after being admitted for COVID-19, patients experience chronic symptoms and functional deterioration (Horwitz et al.,2021).

Recent research reveals the creation of a new illness termed as 'long COVID/Post COVID-19 syndrome,' which describes a wide range of symptoms that linger after a COVID-19 infection has been identified (Wijeratne et al.,2020)

The term long COVID has been used since May or June 2020(Mahase et al.,2020)to define those patients who present symptoms once the acute phase of the disease is over. Other names for SARS-CoV-2 infection include chronic COVID-19 syndrome (CCS), post-COVID-19 syndrome, and post-acute sequelae (PASC). Long COVID is a more widespread term that describes the long duration of symptoms in these patients. The current 12-week timeframe is based on the average time it takes for symptoms to go away. The median duration of viral detection in respiratory samples is 18 days, even when sustained viral ribonucleic acid (RNA) detection has been observed for months (Cevic et al.,2021),and Estimates of four weeks to identify the infection's acute phase appear reasonable. Furthermore, in moderate patients with no symptoms, the likelihood of recovering viable and cultivable virus beyond the 10th day after the infection begins is an exception (Basile et al.,2020). It's important to note that these definitions don't mean the sickness is over or that patients have recovered, but rather that the disease's acute phase has concluded.

There have been no consensus definitions for the syndrome till now. In the literature, the words 'long COVID' and 'post-COVID-19 syndrome' are used interchangeably. Post-intensive care syndrome, post viral fatigue syndrome, long-term COVID-19 syndrome, and persistent organ damage are four possible domains that have been discovered.

Long COVID is a multifaceted sickness that represents the long-term repercussions of an acute COVID-19 infection. While thousands of patients had mild COVID-19 symptoms that did not require hospitalization, a disproportionately large number of people are afflicted by post-COVID-19 complications. These symptoms were not widely recognized within healthcare politics at the start of the epidemic, but they have now become enormous issues for clinicians and, as a result, the healthcare system. NICE has issued new guidance that defines post-COVID-19 syndrome as signs and symptoms that appear during or after a COVID-19 infection and last for more than 12 weeks and cannot be explained by another diagnosis. According to the case report, these symptoms might impact any system in the body and fluctuate over time. The term 'long COVID-19' is used to describe both symptomatic COVID-19 (from 4 to 12 weeks) and post-COVID-19 syndrome individuals (12 weeks or more).(Shah et al.,2021)

The number of people who have long COVID is unclear. Long COVID is quantified using a variety of methodologies, including national surveys and patient-led research, making it difficult to compare results across investigations. According to the Office for National Statistics in the United Kingdom, 1 in 5 people has symptoms that last longer than 5 weeks, and 1 in 10 has symptoms that last longer than 12 weeks. (Ayoubkhani et al., 2021)

Between 10% and 20% of COVID-19 patients with symptomatic acute COVID-19 will progress to a persistence phase of clinical manifestations lasting more than one month (Greenhalg et al.,2020), with chronic symptoms such as fatigue, post-exertional malaise, dyspnoea, headache, and many other neurocognitive conditions such as brain fog, inability to perform daily physical tasks (Baig et al.,2020), and an increased risk of developing stress (pfefferbaum et al.,2020). As the pandemic progresses, this disease, known as post-COVID 19 syndrome, is affecting an increasing number of people. Despite leading to evidence-based mitigation techniques (Fuller et al.,2021) and next-generation vaccines, tremendous efforts have been made in the investigation of SARS-CoV-2 infection and protection (Dong et al.,2021). Many pharmaceutical interventions are currently in use, but few have had a true influence on survival, and none have been proved to lessen the disease's sequelae, notably the progression to persistent symptoms. Even with zero cases and universal immunization, the COVID-19 pandemic's implications will not be totally resolved. The long-term management of the impacts of post-COVID-19 syndrome, in particular, is a challenge that necessitates awareness.

RATIONALE:

Only a few short studies reported Characteristics of long COVID symptoms after hospital discharge, but they were limited to respiratory outcomes, primarily pulmonary function or lung imaging, and they focused on previously hospitalized COVID-19 patients. As a result, the full range of COVID-19's long-term health effects in patients remains mostly unknown. The characteristics of long COVID symptoms, which are critical for developing treatment and preventing bad outcomes following acute SARS-CoV-2 infection, are a basic knowledge gap that urgently needs to be addressed. Further study is urgently required to better understand the nature, prevalence, and duration of long COVID experienced by affected individuals, as well as any potential risk factors that may be present. This is particularly important in low- to middle-income countries like Bangladesh, where the majority of the population lives in rural areas outside of the country's capital city of Dhaka. Only a few number of research on ongoing symptoms following COVID-19 infection have been published in Bangladesh .In Bangladesh there are few study reported whole Bangladesh's long covid status. According to a survey of 1002 people, 20% of the participants had symptoms that persisted following COVID-19, with diarrhea being the most prevalent symptom (12.7%), followed by fatigue (11.5%). Another, smaller research of 355 people found that 46% of COVID-19 recovery patients experienced ongoing COVID symptoms, with fatigue being the most often reported symptom. Another a large scale study show that The prevalence of long COVID symptoms at 12 weeks was 16.1% among 2198 patients. 8 different long COVID symptoms were found in total, and they are as follows, in descending order of severity: fatigue, pain, dyspnea, cough, anosmia, appetite loss, headache, and chest pain. But there are no study for a a specific area or community that may differ from another area.In this study long COVID Symptoms of people living at Savar Upazila will be cleared in this study.

Research Questions

What are the Characteristics of long COVID Symptoms people affected by COVID-19 at savar upazila,dhaka,Bangladesh?

Objectives

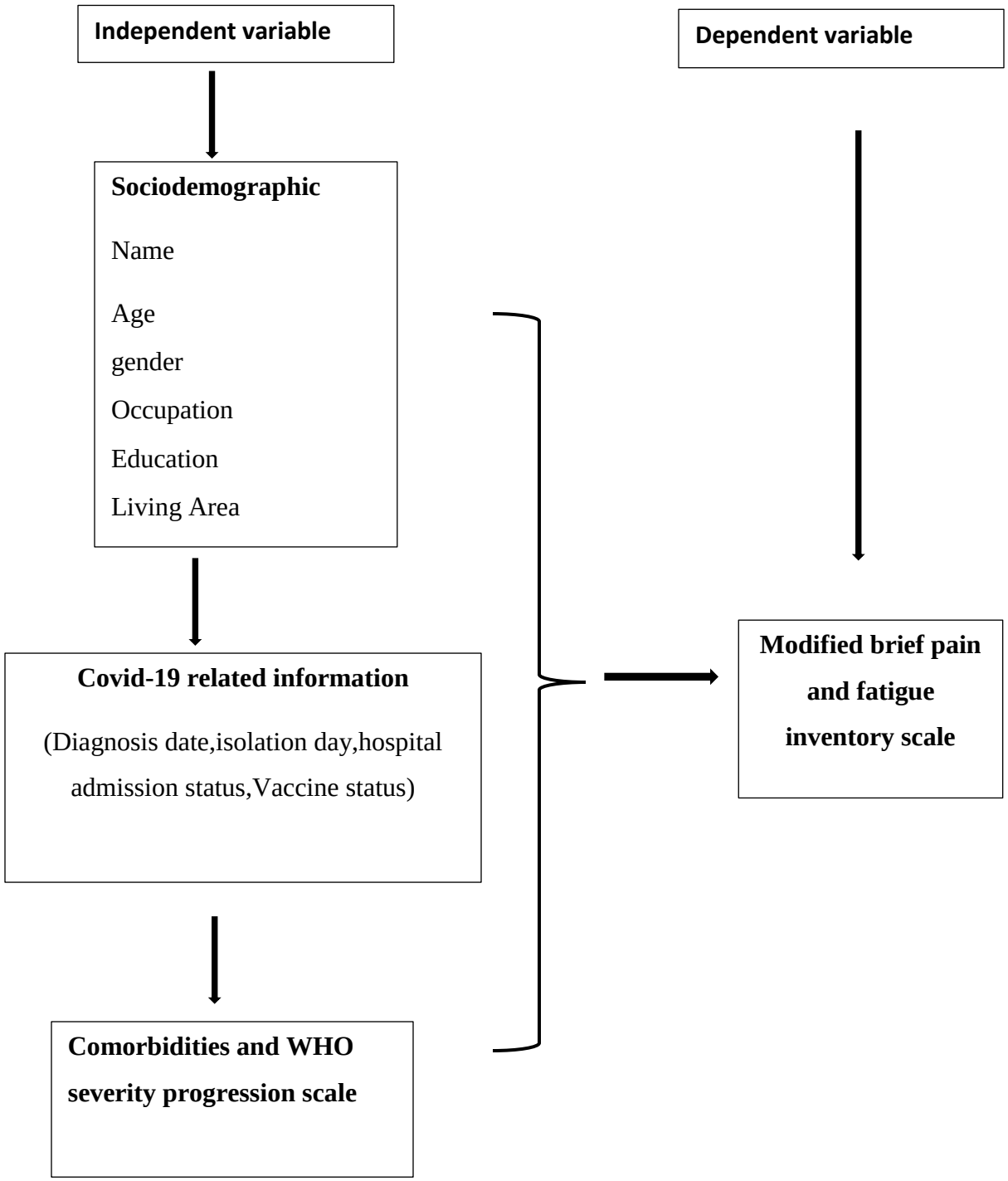
General objectives

To determine the characteristics of long COVID Symptoms after diagnosis COVID 19 disease of people living in Savar upazila,Dhaka,Bangladesh.

Specific Objecctives

- ✓ To identifying symptoms long Covid.
- ✓ To explore the severity of the long covid symptom.
- ✓ Explore the relation among long covid symptoms and socio demographic variables.
- ✓ To explore the level of impact on peoples life due to long covid symptoms.

Conceptual framework



Operational Definition

COVID-19

Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. The majority of those infected with the virus will develop mild to moderate respiratory symptoms and recover without the need for specific treatment. Some people, though, will become critically unwell and require medical help. Serious sickness is more likely to strike the elderly and those with underlying medical disorders such as cardiovascular disease, diabetes, chronic respiratory disease, or cancer. COVID-19 can make anyone sick and cause serious illness or death at any age.

Long COVID

Long COVID is a condition characterized by long-term consequences persisting or appearing after the typical convalescence period of COVID-19. It is also known as post-COVID-19 syndrome, post-COVID-19 condition, post-acute sequelae of COVID-19 (PASC), or chronic COVID syndrome (CCS).

Characteristics of Disease

The structural and functional features of the disease are called characteristics of disease.

Symptom

A physical or mental feature which is regarded as indicating a condition of disease, particularly such a feature that is apparent to the patient.

Severity

Disease severity is a term used to characterize the impact that a disease process has on the utilization of resources, comorbidities, and mortality.

Co-morbidity

In medicine, co-morbidity is the presence of one or more additional conditions often co-occurring with a primary condition. Co-morbidity describes the effect of all other

conditions an individual patient might have other than the primary condition of interest, and can be physiological or psychological.

Brief Pain inventory

The Brief Pain Inventory (BPI) rapidly assesses the severity of pain and its impact on functioning.

Brief Fatigue Inventory

This symptom assessment tool measures nine items on 10-point numeric scales for fatigue level and interference with daily life.

CHAPTER 2 LITERATURE REVIEW

According to a research, 10% of individuals in the UK have chronic or worsening symptoms after the acute viral infection has resolved. (Greenhalgh et al., 2020)

Researchers in Italy found that 60 days after the commencement of the disease, 87.1 percent of COVID-19 released patients still have at least one symptom and 55 percent have three or more, including dyspnoea, chest discomfort, exhaustion, and a lower quality of life(Carfi et al,.2020).

In a study of COVID-19 survivors' long-term health outcomes one year after hospital release in a large cohort of patients, 1095 patients (45.0 percent) reported at least one symptom, with fatigue, sweating, chest tightness, anxiety, and myalgia being the most prevalent. Fatigue and increased symptoms were linked to older age, female gender, and severe disease. In total, 161 patients (6.6%) had CAT total scores of 10 or higher, with risk factors including severe disease during hospitalization or concurrent cerebrovascular disorders. At 1-year follow-up, individuals with severe illness had an increased chance of more symptoms and higher CAT scores (Zhang et al.,2021).

Another research found In an uncontrolled cohort analysis of 478 COVID-19 survivors four months following hospitalization, 244 patients (51%) reported at least one new-onset symptom by telephone interview, including tiredness in 134 of 431 (31%), cognitive problems in 86 of 416 (21%), and dyspnea in 78 of 478. (16%). A total of 63 % of 171 patients screened at an ambulatory visit had CT lung scan abnormalities, mostly modest ground-glass opacities. In 19% of these 171 patients, fibrotic lesions were found. (Morin et al., 2021)

The most commonly reported symptoms and indicators of long COVID were studied in a meta-analysis. Weakness (41%, 95% CI 25.43 to 59.01), general malaise (33%, 95% CI 14.91 to 57.36), fatigue (31% , 95% CI 23.91 to 39.03), concentration impairment (26%, 95% CI 20.96 to 31.73), and breathlessness were the most commonly described symptoms

(with a prevalence of 25%or greater) (25% , 95 % CI 17.86 to 33.97). Patients reported lower quality of life in 37% of trials (95% CI 18.43 to 59.93). Although high I2 values (>80%) were obtained, they were due to narrow estimates dispersion and well-separated estimates and CIs between trials. Other factors are likely to play a role in the variations between these symptoms and the heterogeneity within them (Michelen et al.,2021)

The majority of patients in a telephone survey of 100 hospitalized COVID-19 patients discharged at least 4 weeks prior reported ongoing symptoms. In the ICU group, 72 percent of 32 patients experienced weariness, compared to 60.3 percent in the non-ICU group. This shows that PASC symptoms aren't primarily related to the severity of the disease or the length of stay in the ICU. Dyspnea (65.6 percent in the ICU group and 42.6 percent in the non-ICU group) and psychological distress were also common symptoms (46.9 percent in the ICU group and 23.5 percent in the non-ICU group). According to the EQ-5D instrument, 8% of patients in the ICU group and 45.6 percent of patients in the non-ICU group indicated a deterioration in health status (Halpin et al.,2021)

A multi-state telephone interview of 274 patients with mild SARSCoV-2 also found that the majority had persistent symptoms . Cough (43%), tiredness (35%), and dyspnea were the most prevalent complaints (29 %). About 57 % of patients with three chronic diseases said they didn't get back to their baseline health, and 47 % of patients over 50 said they didn't get back to their usual health (Tanforde et al.,2020)

Between December 2019 and May 2020, an online survey of 3762 patients who had symptoms that were consistent with COVID-19 was done. Seven months after the initiation of COVID-19 Symptoms of chronic fatigue, post-exertional malaise, and cognitive dysfunction were reported by 77.9%, 71.2 % and 67.5 %of patients. When opposed to before the infection, many people were unable to work or had a restricted work schedule (Davis et al.,2020)

Six months after discharge, 76 percent of 1733 patients with laboratory confirmed COVID-19 reported at least one of the following symptoms: fatigue/muscle weakness (63%), difficulty sleeping (26 %), hair loss (22%), impaired smell and taste (11% and 9%, respectively), and mobility problems (7 %) (Huang et al., 2021)

Long COVID (defined as symptoms lasting more than 12 weeks) is estimated to impact 10% of patients who test positive for COVID-19, according to symptom surveillance studies. According to preliminary MRI data, 70% of 'low-risk' patients who test positive for COVID-19 show evidence of damage in one or more organs 4 months following symptom onset. Fatigue, shortness of breath, and cognitive dysfunction were rated as the three most debilitating symptoms of extended COVID in a survey. 89 % of survey participants said that mental and/or physical exertion provoked a symptom relapse (Davis et al.,2020)

In a prospective, longitudinal, and observational study, symptomatic individuals who had recovered from acute SARS-CoV-2 were evaluated by MRI more than three months after diagnosis (only 18% required hospitalization); two-thirds of them (66%) had persistent lesions of different entities in one or more organs, primarily the heart and lungs. The researchers also used standard questionnaires to examine symptoms and organ function (heart, lungs, kidneys, liver, pancreas, spleen). Patients with post-COVID-19 syndrome typically experienced fatigue, muscle aches, dyspnea, and headaches. These data point to the likelihood of residual organ involvement as a cause of long-term symptoms, even in moderate cases, in at least a small number of patients (Dennis et al.,2020)

After recovering from their initial sickness, COVID-19 survivors can endure persistent symptoms, according to a study. Fatigue, shortness of breath, cough, and sleep disturbances were the most common complaints mentioned. Memory loss, muscle discomfort, weakness, heart palpitations, headaches, difficulty concentrating, dizziness, sore throat, loss of smell, loss of taste, skin rashes, hair loss, diarrhoea, and vomiting are among the other symptoms recorded. Anxiety problems and psychiatric illnesses were also mentioned. COVID-19 has also been linked to reduced immunity, coagulation problems, and inflammation, according to our findings. COVID-19 survivors may develop mental illnesses like depression and anxiety problems. Lung and heart damage may occur, however the extent and duration of this damage must be determined further (Iwu et al.,2021).

COVID-19 and stroke have been linked in a number of studies. A total of 409 patients with COVID-19 who presented with neurological symptoms were included in a systematic study. They discovered that 6 patients (1.4%) had acute cerebrovascular illness (correia et al.,2020). Similarly, defined a group of 275 COVID19 patients who had cerebrovascular illness, the majority of which was ischemic stroke (82%). The most common cause was great vascular disease (47 percent), with a mean age of 64.16 14.73 years (range 27–92 years) and 54 percent of men. The outcomes are short-term and primarily connected to the hospitalization phase for acute treatment; 129 patients (65.48 percent) survived or remained critically ill, while 68 patients (34.52 percent) died.SARS-CoV-2 can cause stroke by a variety of mechanisms, including invasion of the artery wall, which causes coagulopathy due to endothelial inflammation, cardiac injury, which causes clot formation, or destabilization of an atheroma plaque (Fraiman et al.,2020). Stroke patients with COVID19 infection had a reported death rate of 39%, which is much greater than stroke patients without COVID19 infection (Amiri et al.,2022)

2504 COVID-19 individuals were reviewed in a comprehensive review, and 11 cases of Guillain-Barré syndrome were documented in this study (0.4 percent). Despite the lower number, these patients suffer from long-term irreversible neurological consequences or even death. In this regard, the link between COVID-19 and the development of Guillain-Barre syndrome, which nearly always occurs during the acute phase of infection, has piqued researchers' curiosity (Abolmaali et al.,2021). The powerful immunological response that occurs throughout the infectious phase, together with subsequent activation of pro-inflammatory cytokine cascades, has been linked to the appearance of this neuropathy associated with SARS-Cov-2 infection (Hussain et al.,2021).

They reported cases of status epilepticus caused by COVID-19 in a comprehensive review and metanalysis. 42 patients (1%) out of 3707 patients (all under the age of 18) had neurological issues, with 12 of these patients (0.3%) having seizures, leaving neurological sequelae of varying severity (Panda et al.,2021)

Hypertension (55%) is the most common concomitant condition among COVID-19 patients, followed by coronary artery disease and stroke (32%), and diabetes (31%). The

following chronic illnesses are less common among COVID-19 patients: liver diseases (9%), chronic obstructive lung disease (7%), malignancy (6%), chronic renal failure (4%), gastrointestinal diseases (3%), and central nervous system diseases (3%). (Kakodkar et al..,2020)

According to one study, COVID-19 caused heart damage in 20% of hospitalized patients in China. Comorbidities, mechanical ventilation, and other problems were more common in these patients (e.g., ARDS 59 percent, acute renal damage 9 percent, electrolyte disturbances 16 percent, hypoproteinemia 13 percent, and coagulation disorders 7%). They also had a significantly higher death rate (51 percent vs. 5%). (Shi et al.,2020).

Some individuals who have recovered from the initial respiratory symptoms of COVID-19 will require further rehabilitation after discharge from acute care. How many of these patients will require long-term care? In one study, 30% of patients hospitalized with sepsis (which has a mortality rate equivalent to COVID-19) required facility-based treatment, while another 20% required home health care (Graboeski et al.,2020).

CHAPTER 3 METHODOLOGY

3.1 Study design: A cross-sectional descriptive research was performed using structured questionnaires with those who tested positive for COVID-19. This study design was ideal for determining the objectives.

In this type of research study, either the entire population or a subset thereof is selected, and from these individuals, data are collected to help answer research questions of interest. It is called cross-sectional because the information about X and Y that is gathered represents what is going on at only one point in time. In a Cross-sectional study questionnaire is a way of collecting information by engaging in a special kind of conversation. This conversation, which could actually take place face to face, by telephone or even via the mail, has certain rules that separate the questionnaire from usual conversations. The researcher decides what is relevant to his or her study and may ask questions, possibly personal or even embarrassing questions. These questions should be both understandable and relevant to the purpose of the research. The respondent in turn may refuse to participate in the conversation and may refuse to answer any particular question. But having agreed to participate in the study, the respondent has the responsibility to answer questions truthfully. (Olsen et al.,2004)

A cross-sectional study is distinguished by the ability to examine multiple demographic groups at a single point in time, and the conclusions are drawn from whatever fits into the frame. It allows researchers to compare multiple variables at once, such as age, gender, income, and educational status when it comes to walking.

3.2 Study area: Data were collected from the Savar Upazila, Dhaka, Bangladesh. The researcher contacts the participants by cell phone and arranges to meet with them in specific locations. All of the COVID-19 patients who were chosen for this study and met the inclusion criteria. The research goal and objectives were explained to each participant by

the researcher. Data of people who willingly participated in the study was taken by the researcher.

3.3 Study Population: The study population is any set of people or events from which the sample is selected and to which the study results will generalize. The members of a clearly defined group or class of people, things, or events that are the subject of the inquiry are referred to as a population. The research populations were chosen based on a literature review and the study's objectives. In this study the study population were COVID-19 survivors in Savar Upzilla, Dhaka, Bangladesh after diagnosis COVID-19 on Rt-pcr test and have ongoing symptoms.

3.4 Study duration: The study were conducted over Eight months from November 2021 to june 2022.The entire period was divided into different activities .

3.5 Sampling Technique

Sample were selected using convenience sample technique to interview the study population considering the inclusion and exclusion criteria. This will be followed by the eligibility of study samples and sample size requirement being selected purposively for collecting samples.

Convenience sampling (also known as Haphazard Sampling or Accidental Sampling) is a type of nonprobability or nonrandom sampling where members of the target population that meet certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate are included for the purpose of the study(Dornyei et al.,2007). It is also referred to the researching subjects of the population that are easily accessible to the researcher(Given et al.,2008). Convenience samples are sometimes regarded as ‘accidental samples’ because elements may be selected in the sample simply as they just happen to be situated, spatially or administratively, near to where the researcher is conducting the data collection. Ecological data are often taken

using convenience sampling, here data are collected along roads, trails or utility corridors and hence are not representative of population of interest.

3.6 Inclusion and Exclusion Criteria

Inclusion criteria

- patients with laboratory confirmed COVID-19 and passes 12 weeks after confirmation at savar upazila in Bangladesh will eligible for participation .(kayaaslan et al.,2021)
- Age- 15-85 years. less then 18 years children are included with the written concern of parents to co relate symptom severity with children. (de souza et all.,2020)
- Both male & female (Nasiri et al.,2020)

Exclusion criteria

- Those patients who are not interested to participant in the study.(heyns et al.,2021)
- Patients still outside of the Savar, Bangladesh.
- The people who have a mental illness.

3.7 Sample Size

Formula of one-sample population had been used to calculating sample size

$$N = \frac{Z^2pq}{d^2}$$

Here,

N = Desired sample size

Z = Standard normal deviate usually set at 1.96 which correspondents to 95% confidence level.

P = 50%

= 0.5

Q = 1-p = 1-0.5 = 0.5

D = Degree of accuracy desire, usually set at 0.05%

Now, required sample size will be:

$$N = \frac{Z^2 pq}{d^2}$$

$$= \frac{(1.96)\ 2 \times (0.5) \times (0.5)}{(0.05)\ 2}$$

= 384.16

So sample size is 384.

Where,

Z = Confidence level 95% for this study.

P = Estimated proportion of the target population estimated to have a particular characteristic of

q = 1-p

d = desired decision level 0.05%

n = desired sample size and will be now 384

3.8 Data Collection Procedure

Data collection procedure were included by face to face with structured questionnaire interview using a closed-ended question. Because a structured questionnaire allowed the researcher to collect all the necessary data while allowing participants to react freely and provide examples of the topic. The development of a systematic, closed-ended questionnaire for socio-demographic indicators by the researcher to get the accurate data from each and every part of the participant.

3.8.1 Data collection tool

- ✓ Consent form
- ✓ Pen
- ✓ Pencil
- ✓ Paper
- ✓ Eraser
- ✓ Clip board
- ✓ Mobile Phone
- ✓ Questionnaire

3.8.2 Mesurement tool:

The Brief Pain Inventory Scale

The Brief Pain Inventory (BPI) rapidly assesses the severity of pain and its impact on functioning. The BPI has been translated into dozens of languages, and it is widely used in both research and clinical settings.The BPI is available in two formats: the **BPI short form**, which is used for clinical trials and is the version used for the foreign-language translations; and the **BPI long form**, which contains additional descriptive items that may be clinically useful (for example, items that expand the possible descriptors of pain, such as burning, tingling, etc.).

- **Purpose:** To assess the severity of pain and the impact of pain on daily functions
- **Population:** Patients with pain from chronic diseases or conditions such as cancer, osteoarthritis and low back pain, or with pain from acute conditions such as postoperative pain
- **Assessment areas:** Severity of pain, impact of pain on daily function, location of pain, pain medications and amount of pain relief in the past 24 hours or the past week
- **Responsiveness**: Responds to both behavioral and pharmacological pain interventions
- **Method:** Self-report or interview
- **Time required:** Five minutes (short form), 10 minutes (long form)
- **Scoring:** No scoring algorithm, but "worst pain" or the arithmetic mean of the four severity items can be used as measures of pain severity; the arithmetic mean of the seven interference items can be used as a measure of pain interference
- **Reliability:** Cronbach alpha reliability ranges from 0.77 to 0.91

Scoring: Respondents rate each item on a 0–10 numeric scale, with 0 meaning “no pain” and 10 meaning “pain as bad as you can imagine.” Scores are categorized as Mild (1–3), Moderate (4–6), and Severe (7–10). Finally, a global pain score can be found by averaging the score obtained on each test item.

The Brief Fatigue Inventory

The Brief Fatigue Inventory (BFI) is used to rapidly assess the severity and impact of cancer-related fatigue. An increasing focus on cancer-related fatigue emphasized the need for sensitive

tools to assess this most frequently reported symptom. The six interference items correlate with standard quality-of-life measures.

- **Purpose:** To assess the severity of fatigue and the impact of fatigue on daily functioning
- **Population:** Patients with fatigue
- **Assessment Areas:** Severity of fatigue and the impact of fatigue on daily functioning in the past 24 hours
- **Method:** Self-report, interview with research staff, or interactive voice response system (IVR)
- **Time required:** Five minutes
- **Scoring:** A global fatigue score can be obtained by averaging all the items on the BFI
- **Reliability:** Cronbach alpha reliability ranges from 0.82 to 0.97

Scoring: Respondents rate each item on a 0–10 numeric scale, with 0 meaning "no fatigue" and 10 meaning "fatigue as bad as you can imagine." Scores are categorized as Mild (1–3), Moderate (4–6), and Severe (7–10). Finally, a global fatigue score can be found by averaging the score obtained on each test item.

3.9 Data Analysis

Data were analyzed with the software named Statistical Package for Social Science (SPSS) version 22.0 and Microsoft Excel 2019. Every questionnaire was rechecked for missing information or unclear information. First put the name of variables in the variable view of SPSS and the types, values, decimal, label alignment, and measurement level of data. The next step was to input the data view of SPSS. After inputting all data researcher checked the inputted data to ensure that all data had been accurately transcribed from the questionnaire sheet to the SPSS data view. Then the raw data was ready for analysis in SPSS.

Frequency, percentages, mean and standard deviation were used to calculate the data. Fisher -exact test were used where p-value were indicated as level of significance.

The one-tailed p value for Fisher's Exact Test is calculated as:

$$p = \frac{\binom{A+C}{A}\binom{B+D}{B}}{\binom{N}{A+B}} = \frac{(A+B)!(C+D)!(A+C)!(B+D)!}{A!\,B!\,C!\,D!\,N!}$$

This produces the same p value as the CDF of the hypergeometric distribution with the following parameters:

- population size = n
- population "successes" = a+b
- sample size = a + c
- sample "successes" = a

During Association in between sex and average Pain:

P = (177+1)!(117+3)!(177+117)!(1+30)!/177!1!117!3!294!=0.023

In this way researcher has calculated all the Co-relation and have presented in the following tables–

Table 3.9.1:Association in between sex and average Pain

Sex Group	Mild pain	Moderate pain	Severe pain	FET value	P value
Male	172 97.2%	4 2.3%	1 0.6%	6.899	.023*
Female	105 89.7%	9 7.7%	3 2.6%		

Table 3.9.2: Association of MBPI and MBFI with socio-demographic and variable

	FET Value	P value
Association between age category and mean pain severity	8.383	0.696
Association between age category and pain interfered with general activity during past 24 hours	14.118	0.14
Association between age category and pain interfered with mood during past 24 hours	13.224	0.416
Association between age category and pain interfered with walking ability during past 24 hours	13.941	0.303
Association between age category and pain interfered with normal work during past 24 hours	3.581	0.699
Association between age category and pain interfered with relation with other people during past 24 hours	3.534	0.703
Association between age category and pain interfered with sleep during past 24 hours	15.977	0.068
Association between age category and pain interfered with enjoyment of life during past 24 hours	2.414	0.873
Association between age category and mean fatigue severity	15.465	.162
Association between age category and fatigue interfered with general activity during past 24 hours	14.464	.182

Association between age category fatigue interfered with mood during past 24 hours	13.948	.186
Association between age category and fatigue interfered with walking ability during past 24 hours	13.344	0.418
Association between Age category and fatigue interfered with normal work during past 24 hours	14.464	0.182
Association between age category and fatigue interfered with relation with other people during past 24 hours	9.380	0.116
Association between age category and fatigue interfered with sleep during past 24 hours	16.700	0.081
Association between age category and fatigue interfered with enjoyment of life during past 24 hours	6.613	0.308
Association between Sex of the participant and mean pain severity	6.899	.0223*
Association between Sex of the participant and pain interfered with general activity during past 24 hours	7.545	.014*
Association between Sex of the participant and pain interfered with mood during past 24 hours	7.430	.014*
Association between Sex of the participant and pain interfered with walking ability during past 24 hours	4.652	0.008**
Association between Sex of the participant and pain interfered with normal work during past 24 hours	4.635	0.40

Association between Sex of the participant and pain interfered with relation with other people during past 24 hours	2.673	0.112
Association between Sex of the participant and pain interfered with sleep during past 24 hours	4.993	0.062
Association between Sex of the participant and pain interfered with enjoyment of life during past 24 hours	2.678	0.112
Association between Sex of the participant and mean fatigue severity	12.482	0.002**
Association between Sex of the participant and fatigue interfered with general activity during past 24 hours	11.514	0.002**
Association between Sex of the participant and fatigue interfered with mood during past 24 hours	12.317	0.001***
Association between Sex of the participant and fatigue interfered with walking ability during past 24 hours	13.345	0.001***
Association between Sex of the participant and fatigue interfered with normal work during past 24 hours	11.514	0.002**
Association between Sex of the participant and fatigue interfered with relation with other people during past 24 hours	15.954	0.063
Association between Sex of the participant and fatigue interfered with sleep during past 24 hours	17.737	0.001***

Association between Sex of the participant and fatigue interfered with enjoyment of life during past 24 hours	11.56	0.071
Association between vaccination and mean pain severity	2.520	0.200
Association between vaccination and pain interfered with general activity during past 24 hours	5.066	0.079
Association between vaccination and pain interfered with mood during past 24 hours	2.029	0.416
Association between vaccination and pain interfered with walking ability during past 24 hours	1.721	0.452
Association between vaccination and pain interfered with normal work during past 24 hours	1.497	0.238
Association between vaccination and pain interfered with relation with other people during past 24 hours	0.111	0.755
Association between vaccination and Pain interfered with sleep during past 24 hours	3.091	0.144
Association between vaccination and pain interfered with enjoyment of life during past 24 hours	0.926	0.350
Association between vaccination and mean fatigue severity	5.573	0.105
Association between vaccination and fatigue interfered with general activity during past 24 hours	4.004	0.128

Association between vaccination and fatigue interfered with mood during past 24 hours	5.849	0.137
Association between vaccination and fatigue interfered with walking ability during past 24 hours	4.893	0.072
Association between vaccination and fatigue interfered with normal work during past 24 hours	6.483	0.125
Association between vaccination and fatigue interfered with relation with other people during past 24 hours	4.528	0.056
Association between vaccination and fatigue interfered with sleep during past 24 hours	5.722	0.063
Association between vaccination and fatigue interfered with enjoyment of life during past 24 hours	2.932	0.092
Association in between Co-morbidities and mean pain severity	14.697	0.026*
Association in between Co-morbidities and pain interfered with general activity during past 24 hours	19.448	0.004**
Association in between Co-morbidities and pain interfered with mood during past 24 hours	14.471	0.050*
Association in between Co-morbidities and pain interfered with walking ability during past 24 hours	22.065	0.001***
Association in between Co-morbidities and pain interfered with normal work during past 24 hours	10.735	0.014*
Association in between Co-morbidities and pain interfered with relation with other people during past 24 hours	7.587	0.057

Association in between Co-morbidities and Pain interfered with sleep during past 24 hours	19.448	0.004**
Association in between Co-morbidities and pain interfered with enjoyment of life during past 24 hours	7.587	0.057
Association in between Co-morbidities and mean fatigue severity	16.344	0.079
Association in between Co-morbidities and fatigue interfered with general activity during past 24 hours	8.995	0.305
Association in between Co-morbidities and fatigue interfered with mood during past 24 hours	12.850	0.071
Association in between Co-morbidities and fatigue interfered with walking ability during past 24 hours	10.185	0.338
Association in between Co-morbidities and fatigue interfered with normal work during past 24 hours	7.609	0.455
Association in between Co-morbidities and fatigue interfered with relation with other people during past 24 hours	5.940	0.162
Association in between Co-morbidities and fatigue interfered with sleep during past 24 hours	12.634	0.094
Association in between Co-morbidities and and fatigue interfered with enjoyment of life during past 24 hours	4.780	0.262

Here, P<0.05=*, P<0.01=** and P<0.001=***

3.10 Data Presentation

Data were presented in table and graph so that it can be visualized at a glance.

3.11 Inform consent

Written consent was given to all participants prior to the completion of the pre test questionnaire. I explained the participants about his or her role in this study. I received a written consent form every participant including signature. So, the participant assured that they could understand about the consent form and their participation was on voluntary basis. The participants were informed clearly that their information would be kept confidential. I assured the participants that the study would not be harmful for them. It was explained that there might not a direct benefit from the study for the participants but in the future cases like them might got benefit from it. The participants have the right to withdraw consent and discontinue participation at any time.

3.12 Ethical consideration

- ✓ Permission will be taken must from 'Institutional Review Board'(concern authority) before of the collecting data.
- ✓ All participants were informed about the aim, objectives for the study prior to participants.
- ✓ Must be informed consent had been taken.
- ✓ The participations or patients had given right to proceed & withdrawal from the study in anytime.
- ✓ Strictly maintained of the participation's information very confidentiality.

CHAPTER 4 RESULTS

The aim of the study was To determine the characteristics of long COVID Symptoms after diagnosis of people living in Savar Upazila. Data were numerically coded using an SPSS 17.0 version software program. The collected data were calculated as percentages and presented by using graph and table charts. 294 participants were taken to determine the characteristics of long COVID-19 Symptoms after diagnosis of people living in Savar.

4.1 Socio-Demographical variables

Variable		N	%
Age	18 or less then 18	15	5.1
	19 to 27	64	21.8
	28 to 36	87	29.6
	37 to 45	49	16.7
	46 to 54	34	11.6
	55 to 63	35	11.9
	64 or more then 64	10	3.4
Gender Of the participants	Male	177	60.2
	female	117	39.8
Educational status of the Participants	No formal education	6	2
	primary education	50	17.0
	secondary education	63	21.4
	higher secondary education	98	33.3
	bachelor or above	77	26.2
Marital status of the participants	married	242	82.3
	unmarried	40	13.6

	widow/widower	11	3.7
	divorce	1	.3
Occupation of the participants	student	36	12.2
	private service	32	10.9
	government service	54	18.4
	business	51	17.3
	unemployed	107	36.4
	others	14	4.8
Living area	Rural	102	34.7
	semi urban	161	54.8
	urban	31	10.5
Family Size	Three	2	.7
	Four	22	7.5
	Five	99	33.7
	Six	84	28.6
	Seven	57	19.4
	Eight	20	6.8
	Nine	6	2.0
	Ten	4	1.4

4.1.1 Age of the Participants

Among the 294 participants from whom data were collected the lowest age was 15 and highest age was more than 85 years. And frequency was 5.1% (n=15) participants in between 18 or less than 18 years, 21.8% (n=64) participants in between 19-27years, 29.6% (n=87) participants in between 28-36 years, 16.7% (n=49) participants in between 37-45 years, 11.6% (n=34) participants in between 46-56 years, 11.9% (n=35) participants in

between 55-63 years and 3.4% (n=10) participants in between 64 or mare than 64 participants.

4.1.2 Gender of the participants

Among all participants 60 .2% (n=177) were Male and 39.8 % (n=117) were female in this study .

4.1.3 Educational Status In this study

Among the 294 participants, 2% (n=6) were illiterate, 17% (n=50) had completed primary studies, 21.4 %(n=63) has completed secondary studies, 33.3% (n=98) has completed higher secondary and 26.2% (n=77) completed graduation and further studies .

4.1.4 Marital Status In this study

Among the 294 participants, 82.3% (n=242) were Married, 13.6% (n=40)were unmarried, 3.7 %(n=11) were widow/widower and 0.3% (n=1) take divorce.

4.1.5 Occupation of the Participant

Among the participants, 12 .2% (n=36) were students,10.9% (n=32) were private service holder ,18.4% were government service holder,17.3% (n=51) were businessman,36.4%(n=107) were unemployed and 4.8% (n=14) were from others occupations.

4.1.6 Living area In this study

34.7% (n=102) participants were living in rural ,54.8%(n=161) were living in semi urban area and 10.5% (n=31) participants were living in urban area .

4.1.7 Family Size In this study

Among the 294 participants maximum family member were 10 and minimum family member were 3.Among them 2 family has 3 family member,22 family has 4 family member,99 family has 5 family member,84 family has 6 family member,57 family has 7

family member,20 family has 8 family member,6 family has 9 family member and 4 family has 10 family member.

4.2 COVID 19 related Information in this study

4.2.1 Status of admission to the hospital

Among 294 participants only 7.8%(n=23) were needed to admitted to the hospital and most of them 92.8%(n=271) didn't required to admitted to hospital.

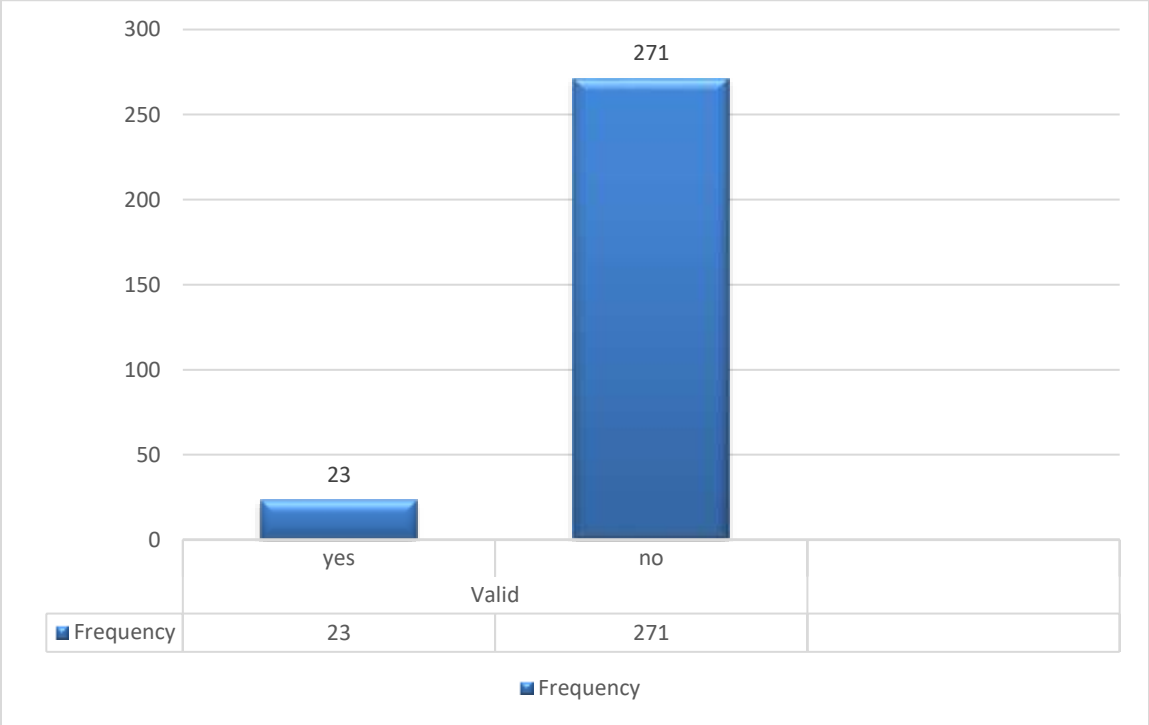


Figure 4.2.1: Status of admission to the hospital

4.2.2 Type of Treatment they received

Among all participants 92.2% (n=273) took medicine for recovery , 3.4%(10) needed ventilation and 3.7%(n=11) needed oxyzen supplementation.

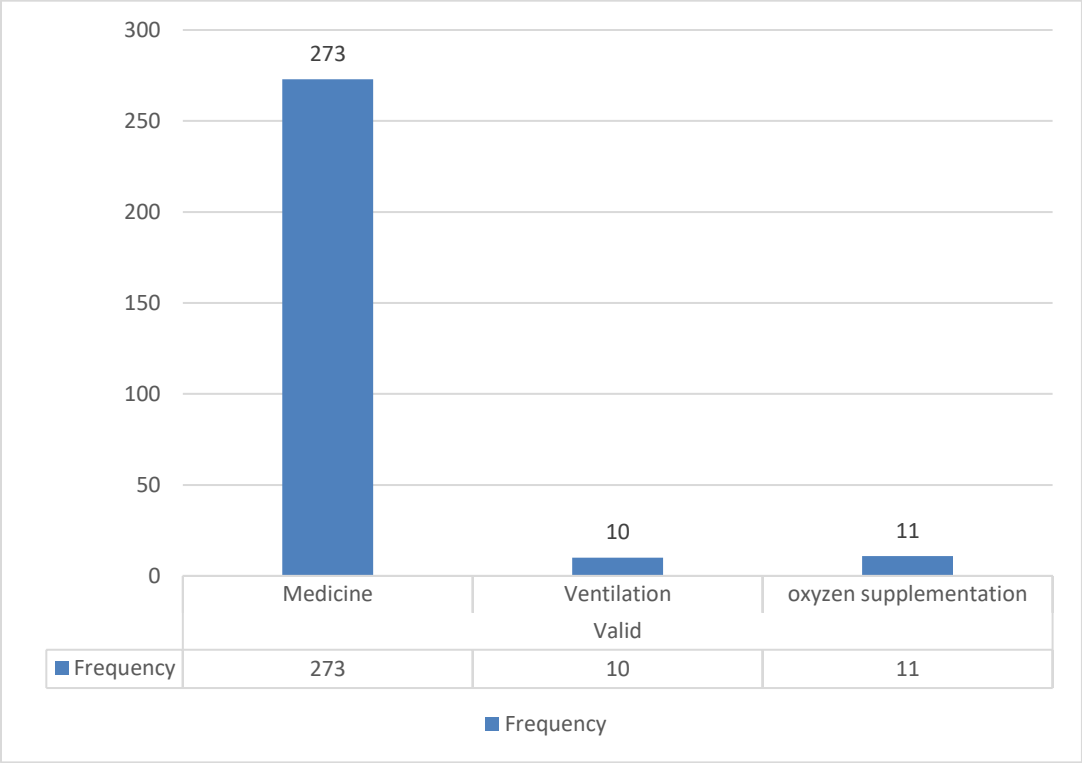


Figure 4.2.2: Type of Treatment they received

4.2.3 Status of vaccination of COVID 19

Among 294 peoples 23.1%(n=68) received 2nd dose of Vaccination and 76.9%(n=226) were received Booster dose of Vaccination.

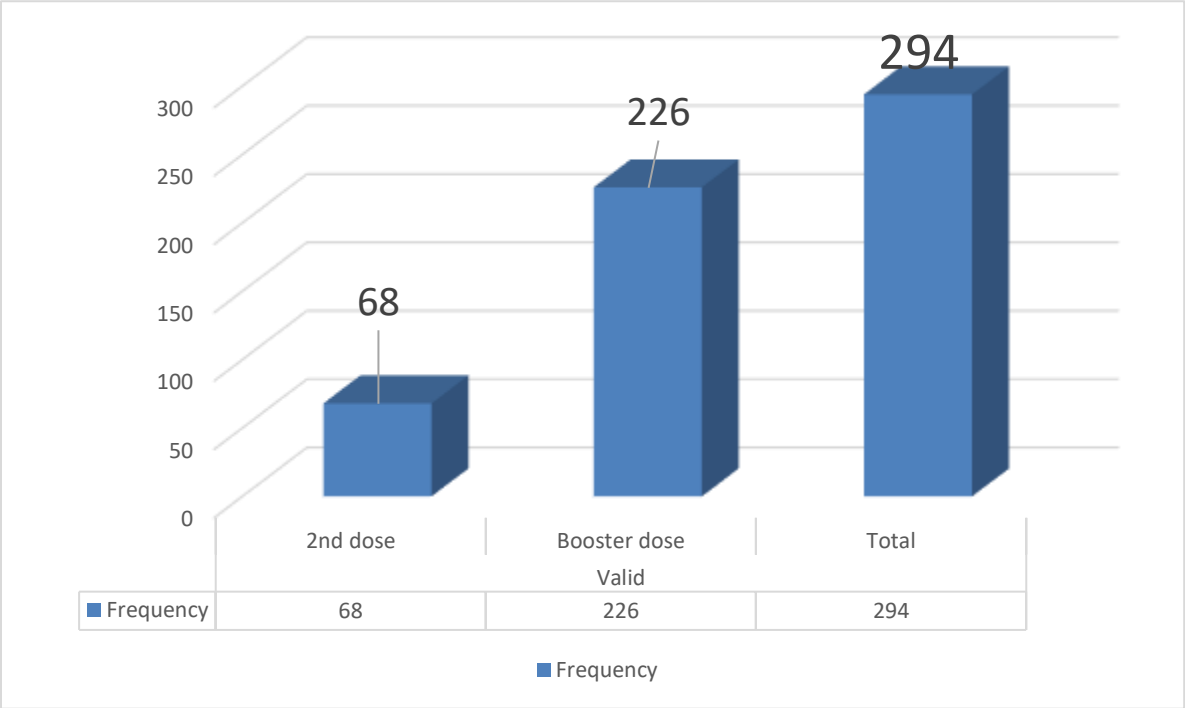


Figure 4.2.3: Status of vaccination of COVID 19

4.3 Status of WHO clinical progression Scale

Among 294 participants 0.7% were Asymptomatic,66% were symptomatic independent,25.9% were symptomatic and needed assistance,4.4% became hospitalized but no needed oxyzen therapy,2% became hospitalized and needed oxyzen by mask or nasal prongs and 1.4 became hospitalized and needed oxyzen by NIB or high flow.

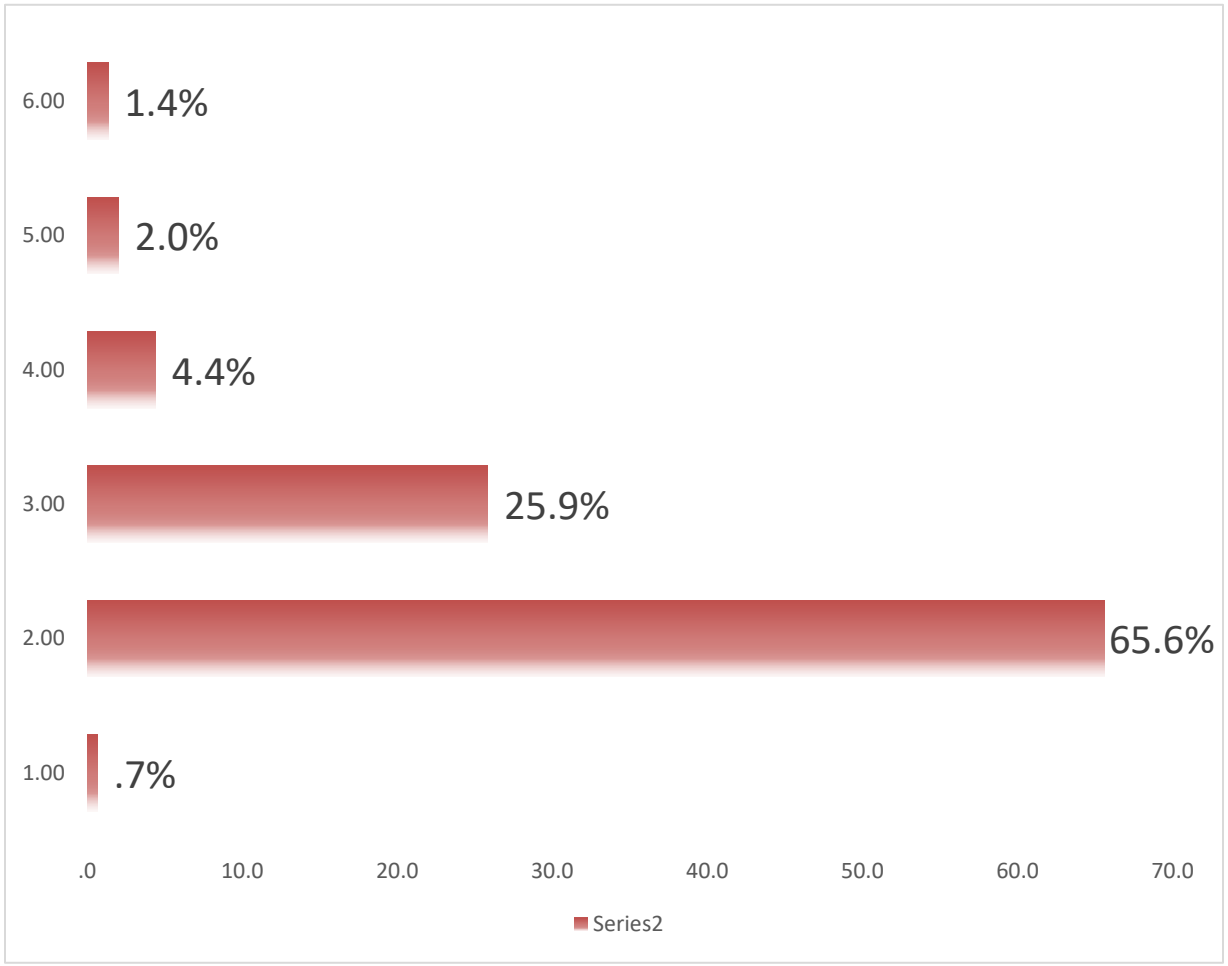


Figure 4.3: Status of WHO clinical progression

4.4.1 Status of self administered Co-morbidity Questionnaire

Among 294 participants about 30.30% participants has at least one Co-morbidity and other 69.70% participants has no Co-morbidity.Among the positive Co-morbidity partipants 7 participants has heart disease,40 participants has high blood pressure,11 participants has lung disease,38 partipants has diabetes,1 participants has anaemia,1 participants has depression,44 participants has osteoarthritis,71 participants has backpain, and 1 perticipants has rheumatoid arthritis.

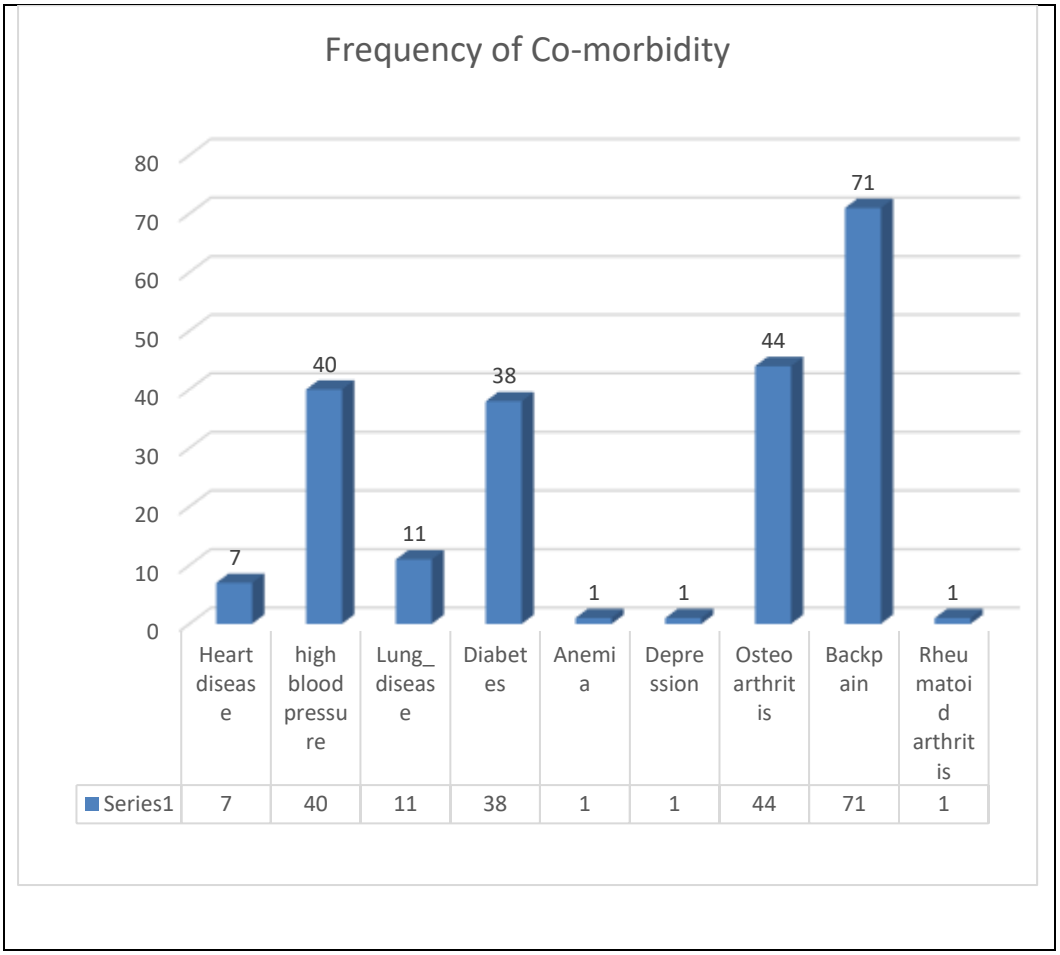


Figure 4.4.1: Status of self administered Co-morbidity

4.4.2 Status of distribution of Co-morbidity

Among the Participants about 205 People has no Comorbidity, 26 Participants has at least 1 Co morbidity, 23 Participants has at least 2 Co morbidity, 22 participants has at least 3 Co morbidity, 15 participants has at least 4 Co morbidity, 2 participants has 5 Co morbidity and 1 participants has 6 Co morbidity

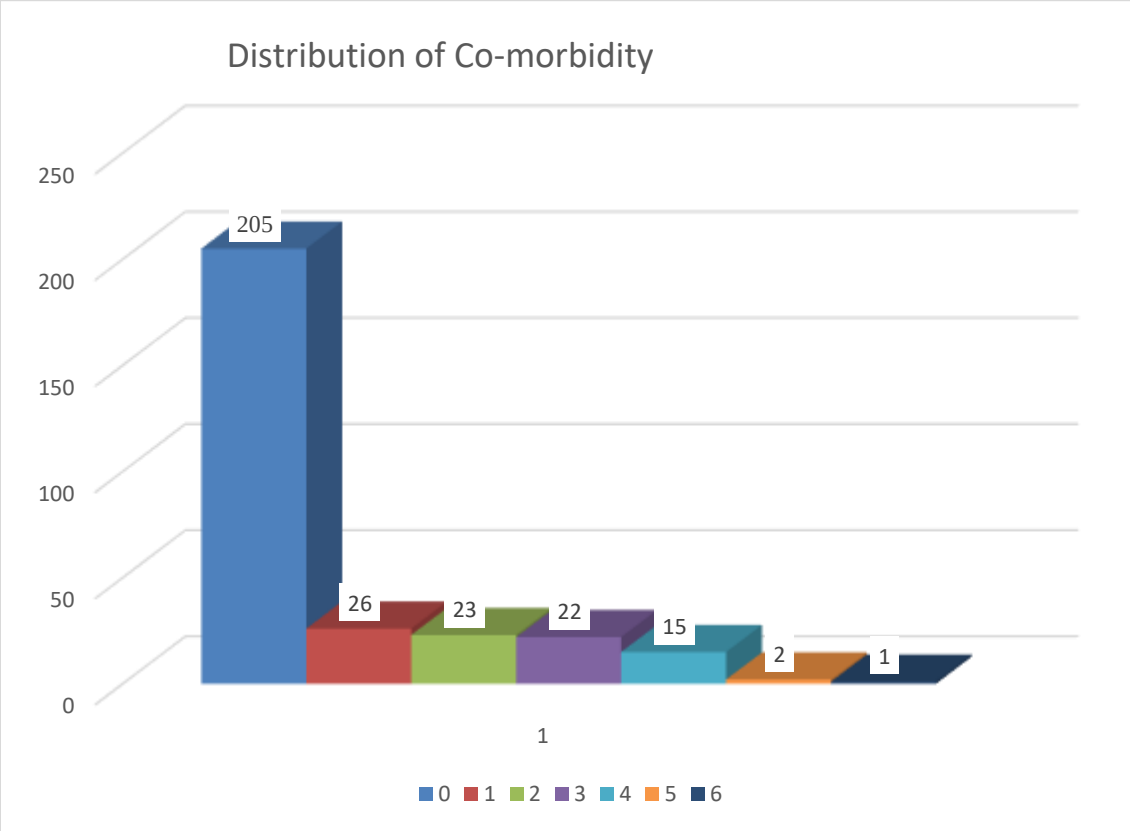


Figure 4.4.2: Status of distribution of Co-morbidity

4.5 Status of Symptom During affected time

During COVID 19 affected time among the participants 88.8% participants had fever,67.0% had cough,75.20% had fatigue, 9.9 % had sputum,47.30% had Headache, 11.60% had diarrhea, 2.40 % had Myalgia, 68.70% had Shortness of breathing, 40.10% had Sore throat, 3.70% had Nausea,4.40% had Chill, 16.00% had Runny nose, , 50.3% had anorexia, 16% had dizziness,77.2% had anosmia, 87.1% had Body pain and 0.70% were asymptomatic.

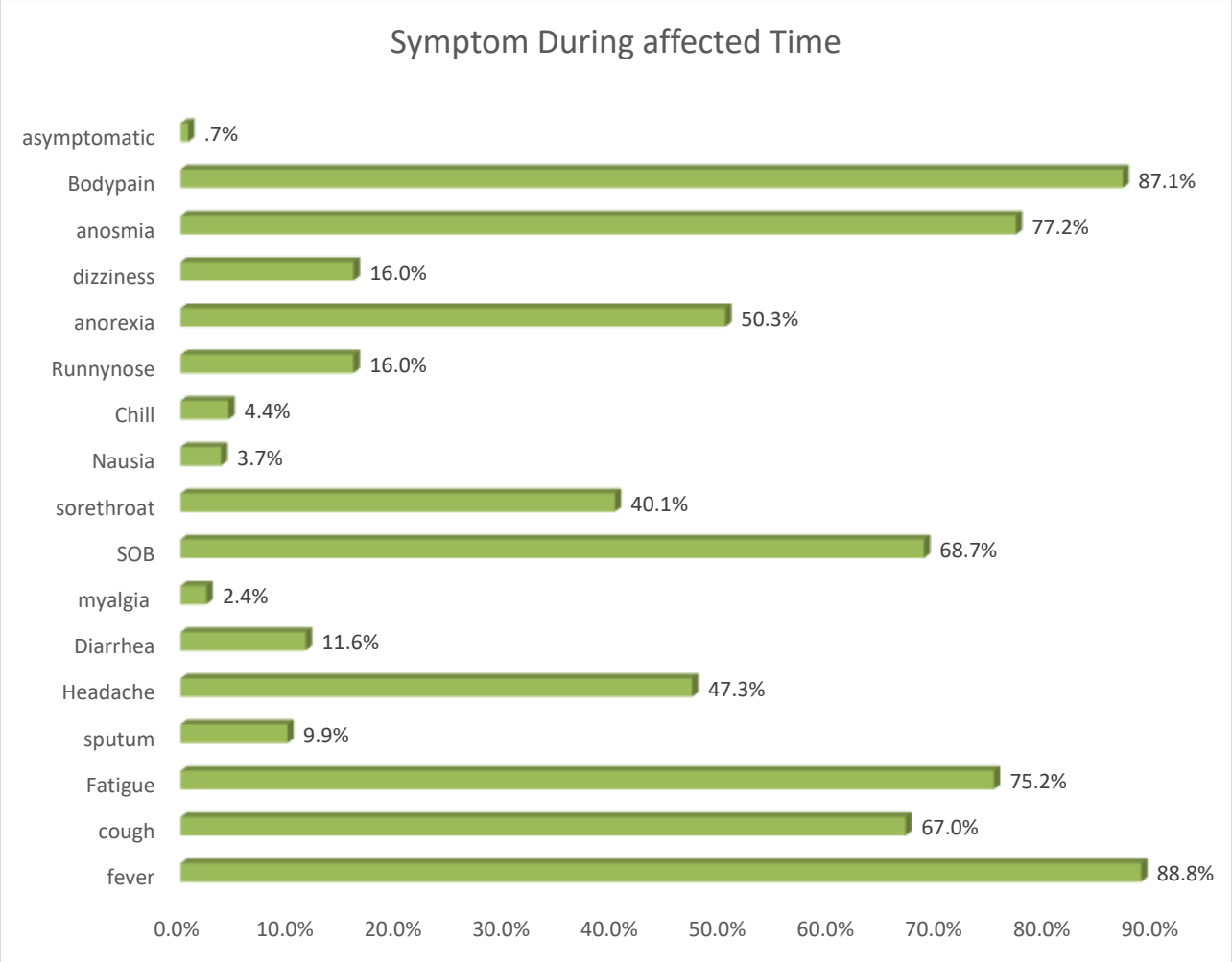


Figure 4.5: Status of Symptom During affected time

4.6 Status of Long COVID Cases

Among the 294 COVID-19 diagnosis patients 15.60% patients has at least one symptom after passes at least 12 weeks from the date of diagnosis.

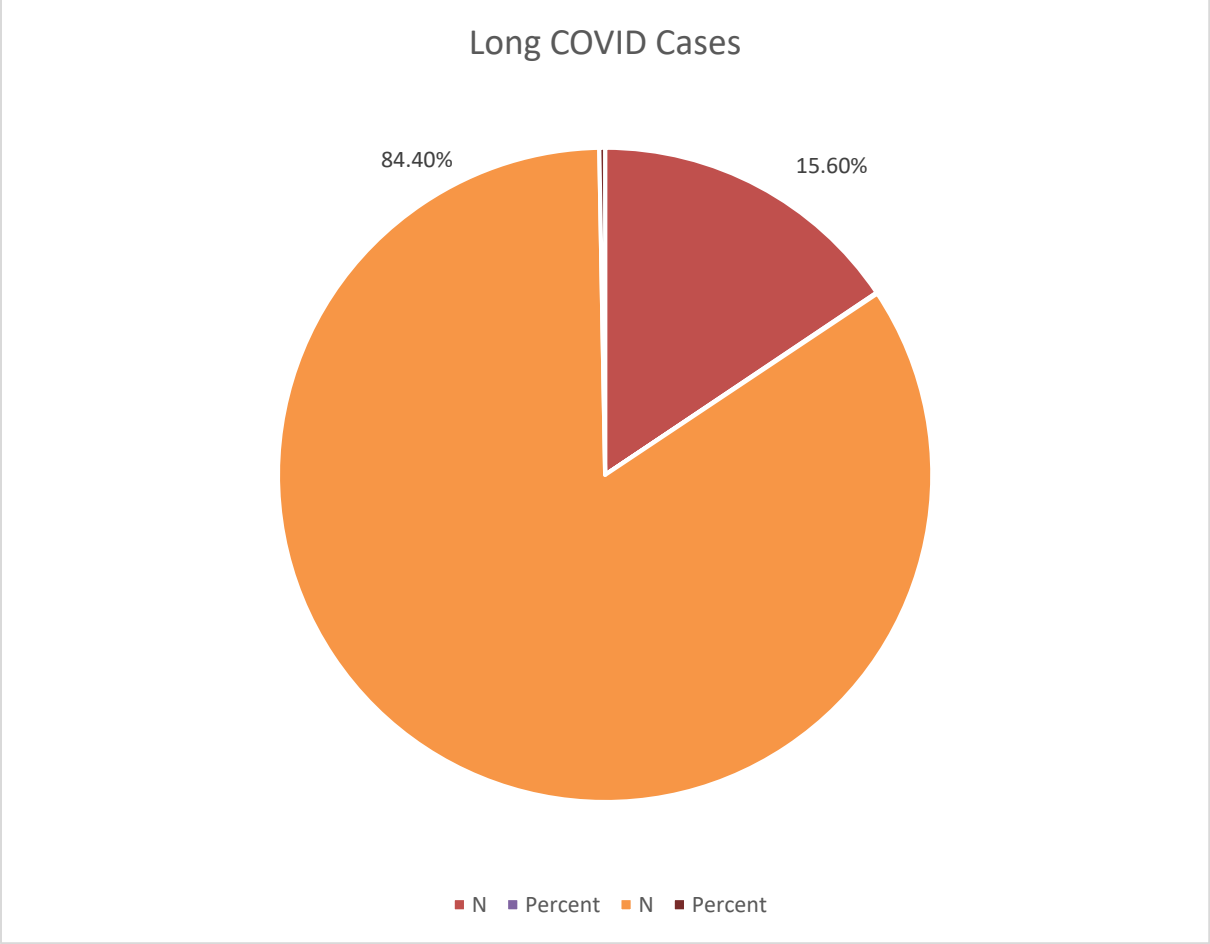


Figure 4.6.1: Status of Long COVID Cases

Among the long COVID patients 2.20 % has Cough ,69.60% has Fatigue, 10.9% has Headache,15.2% has Shortness of breathing, 8.7 % has Anorexia, 2.2% has Dizziness, 13 % has anosmia,41.30% has Body pain, and 15.20% has other symptoms.

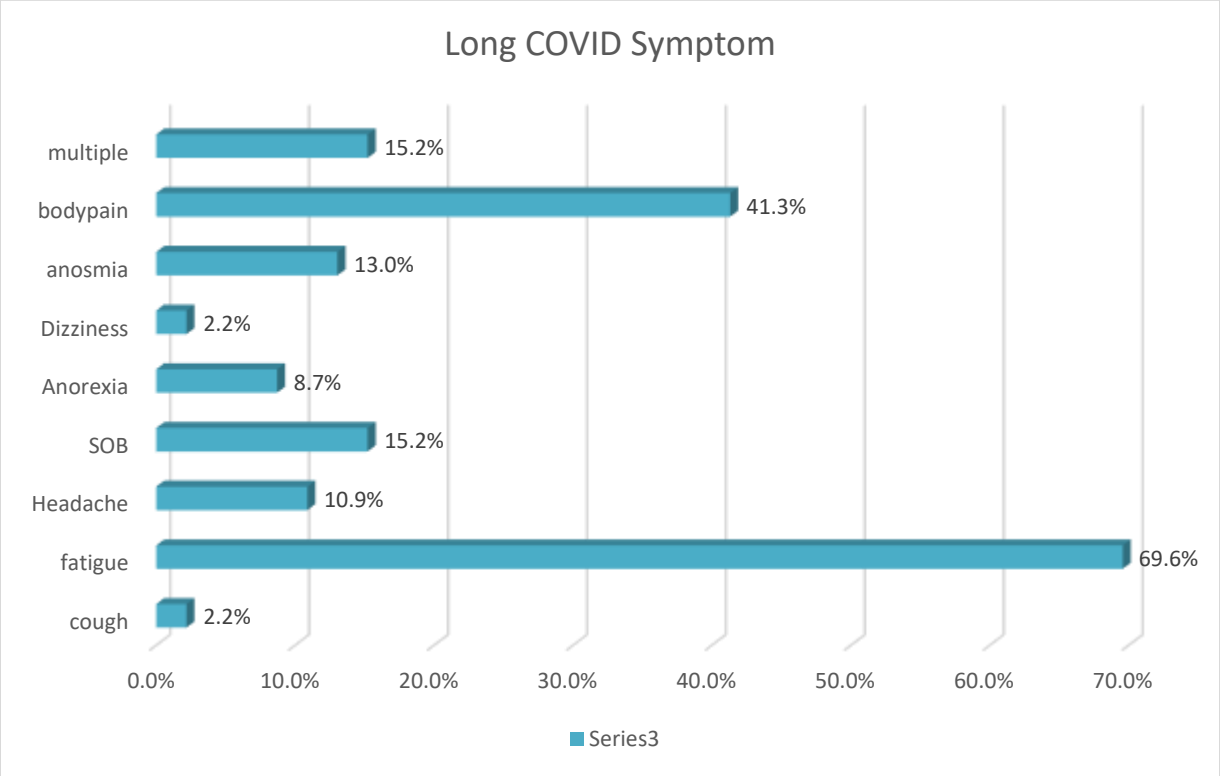


Figure 4.6.2: Long COVID Symptoms

4.7 Association in between Age group and Modified Brief Pain Inventory Questionnaire-

In Fisher exact test association in between Age group and Modified Brief Pain Inventory Questionnaire showing that their p value higher than 0.05. So all are insignificant. That means there is no relation between age and modified brief pain inventory questionnaire.

4.8 Association in between Age group and Modified Brief fatigue Inventory Questionnaire-

In Fisher exact test association in between Age group and Modified Brief fatigue Inventory Questionnaire showing that their p value higher than 0.05. So all are insignificant. That means there is no relation between age and modified brief pain inventory questionnaire.

4.9 Association in between sex group and Modified Brief Pain Inventory Questionnaire- which are significant ,only their count value , fisher's exact test value and p value are given by using table.

4.9.1 Association in between sex and average Pain severity

The table shows Correlations between sex and average pain severity. In Fisher Exact test their FET value is 6.899 and p value is 0.023 which is significant. Among the participants who is male had mild pain in 97.2% participants, moderate pain in 2.3% participants and severe pain in 0.6% participants ; who is female had mild pain in 89.7% participants, moderate pain in 7.7% participants and severe pain in 2.6% participants

4.9.2 Association in between sex and pain interfered general activity during the past 24 hours

The table shows Correlations between sex and pain interfered general activity during the past 24 hours. In Fisher Exact test their FET value is 7.545 and p value is 0.014 which is significant. Among the participants who is male had no pain in 96.6% participants, mild pain in 2.3% participants and moderate pain in 1.1%; who is female had no pain in 88.9% participants, mild pain in 9.4% participants and moderate pain in 1.7%.

4.9.3 Association in between sex and pain interfered mood during the past 24 hours

The table shows Correlations between sex and pain interfered mood during the past 24 hours. In Fisher Exact test their FET value is 7.430 and p value is 0.014 which is significant. Among the participants who is male had no pain in 96.6% participants, mild pain in 2.8% participants and moderate pain in 0.6%; who is female had no pain in 89.7% participants, mild pain in 10.3% participants.

4.9.4 Association in between sex and pain interfered walking ability during the past 24 hours

The table shows Correlations between sex and pain interfered walking ability during the past 24 hours. In Fisher Exact test their FET value is 8.651 and p value is 0.008 which is significant. Among the participants who is male had no pain in 98.3% participants, mild pain in 1.1% participants and moderate pain in 0.6%; who is female had no pain in 92.3% participants, mild pain in 7.7% participants.

4.10 Association in between sex group and Modified Brief fatigue Inventory Questionnaire- which are significant ,only their count value , fisher's exact test value and p value are given by using table.

4.10.1 Association in between sex and average fatigue severity

The table shows Correlations between sex and average fatigue severity. In Fisher Exact test their FET value is 12.482 and p value is 0.002 which is significant. Among the participants who is male had no fatigue in 94.4 % participants, mild fatigue in 4.5% participants, moderate fatigue in 0.6% participants and severe fatigue in 0.6% participants; who is female had no fatigue in 81.2% participants, mild fatigue in 12.8% participants, moderate fatigue in 2.6% participants and severe fatigue in 3.4% participants.

4.10.2 Association in between sex and fatigue interfered general activity during the past 24 hours

The table shows Correlations between sex and fatigue interfered general activity during the past 24 hours. In Fisher Exact test their FET value is 11.514 and p value is 0.002 which is significant. Among the participants who is male had no fatigue in 94.4 % participants, mild fatigue in 5.1% participants and severe fatigue in 0.6% participants; who is female had no fatigue in 82.1% participants, mild fatigue in 17.1% participants and moderate fatigue in 0.9% participants.

4.10.3 Association in between sex and fatigue interfered mood during the past 24 hours

The table shows Correlations between sex and fatigue interfered mood during the past 24 hours. In Fisher Exact test their FET value is 12.317 and p value is 0.001 which is significant. Among the participants who is male had no fatigue in 94.4 % participants, mild fatigue in 5.1% participants and severe fatigue in 0.6% participants; who is female had no fatigue in 81.2% participants, mild fatigue in 17.1% participants and moderate fatigue in 1.7% participants.

4.10.4 Association in between sex and fatigue interfered walking ability during the past 24 hours

The table shows Correlations between sex and fatigue interfered walking ability during the past 24 hours. In Fisher Exact test their FET value is 13.345 and p value is 0.001 which is significant. Among the participants who is male had no fatigue in 96.6% participants, mild fatigue in 3.4% participants; who is female had no fatigue in 84.6% participants, mild fatigue in 14.5% participants and moderate fatigue in 0.9% participants.

4.10.5 Association in between sex and fatigue interfered normal work during the past 24 hours

The table shows Correlations between sex and fatigue interfered normal work during the past 24 hours. In Fisher Exact test their FET value is 12.317 and p value is 0.001 which is significant. Among the participants who is male had no fatigue in 94.4 % participants, mild fatigue in 5.6% participants and severe fatigue in 0.0% participants; who is female had no fatigue in 81.2% participants, mild fatigue in 16.2% participants and moderate fatigue in 1.7% participants.

4.10.6 Association in between sex and fatigue interfered sleep during the past 24 hours

The table shows Correlations between sex and fatigue interfered sleep during the past 24 hours. In Fisher Exact test their FET value is 17.737 and p value is 0.001 which is significant. Among the participants who is male had no fatigue in 94.9 % participants, mild fatigue in 4% participants and severe fatigue in 1.1% participants; who is female had no fatigue in 81.2% participants, mild fatigue in 18.8% participants.

4.11 Association in between Vaccinated group and Modified Brief pain Inventory Questionnaire-

In Fisher exact test association in between vaccinated group and Modified Brief Pain Inventory Questionnaire showing that their p value higher than 0.05. So all are insignificant. That means there is no relation between vaccinated group and modified brief pain inventory questionnaire.

4.12 Association in between Vaccinated group and Modified Brief fatigue Inventory Questionnaire-

In Fisher exact test association in between vaccinated group and Modified Brief fatigue Inventory Questionnaire showing that their p value higher than 0.05. So all are insignificant. That means there is no relation between vaccinated group and modified brief pain inventory questionnaire.

4.13 Association in between Comorbidities and Modified Brief pain Inventory Questionnaire- which are significant ,only their count value , fisher's exact test value and p value are given by using table.

4.13 .1 Association in between Comorbidities and average pain severity-

The table shows Correlations between Comorbidities and average pain severity. In Fisher Exact test their FET value is 14.697 and p value is 0.026 which is significant. That means there is a relation between Comorbidities and average pain severity.

4.13.2 Association in between Comorbidities and pain interfere general activity during past 24 hours- The table shows Correlations between Comorbidities and pain interfere general activity during past 24 hours. In Fisher Exact test their FET value is 19.448 and p value is 0.004 which is significant. That means there is a relation between Comorbidities and pain interfere general activity during past 24 hours.

4.13 .3 Association in between Comorbidities and pain interfere mood during past 24 hours-

The table shows Correlations between Comorbidities and pain interfere mood during past 24 hours. In Fisher Exact test their FET value is 14.471 and p value is 0.50 which is significant. That means there is a relation between Comorbidities and pain interfere mood during past 24 hours.

4.13 .4 Association in between Comorbidities and pain interfere Walking ability during past 24 hours-

The table shows Correlations between Comorbidities and pain interfere walking ability during past 24 hours. In Fisher Exact test their FET value is 22.065 and p value is 0.001 which is significant. That means there is a relation between Comorbidities and pain interfere walking ability during past 24 hours.

4.13 .5 Association in between Comorbidities and pain normal work during past 24 hours-

The table shows Correlations between Comorbidities and pain interfere normal work during past 24 hours. In Fisher Exact test their FET value is 10.735 and p value is 0.014 which is significant. That means there is a relation between Comorbidities and pain interfere normal work during past 24 hours.

4.13 .6 Association in between Comorbidities and pain interfere sleep during past 24 hours-

The table shows Correlations between Comorbidities and pain interfere sleep during past 24 hours. In Fisher Exact test their FET value is 19.448 and p value is 0.004 which is significant. That means there is a relation between Comorbidities and pain interfere sleep during past 24 hours.

4.14 Association in between Comorbidities and modified brief fatigue inventory Questionnaire-

In Fisher exact test association in between Comorbidities and Modified Brief fatigue Inventory Questionnaire showing that their p value higher than 0.05. So all are insignificant. That means there is no relation between Comorbidities and modified brief fatigue inventory questionnaire.

CHAPTER 5 DISCUSSION

The present study used a cross-sectional design to find out the characteristics of long COVID Symptoms after diagnosis COVID 19 disease of people living at Savar upazila, Dhaka, Bangladesh. In this study, the prevalence of long COVID symptoms was 15.6%. This is slightly lower than that reported by the another study of the overall Bangladesh. which reported the prevalence of long COVID symptoms as 16.1 % (Hossaain et al.,2021).

It was found that male were more affected than female the percentage of male and female. Among all participants 60 .2% (n=177) were Male and 39.8 % (n=117) were female in this study .In this study female affected ratio are lower then male.But a study of covid 19 reported that female are more affected then male.(lane et al.,2022)

In this study 5.1% (n=15) participants in between 18 or less than 18 years, 21.8% (n=64) participants in between 19-27years, 29.6% (n=87) participants in between 28-36 years, 16.7% (n=49) participants in between 37-45 years, 11.6% (n=34) participants in between 46-56 years, 11.9% (n=35) participants in between 55-63 years and 3.4% (n=10) participants in between 64 or mare than 64 participants.This study show that maximum participants are middle age people. In this study most of the participants came from the semi urban area which was about 55% .Among the 34.7% (n=102) participants were living in rural , and 10.5% (n=31) participants were living in urban area . Among them, 2% (n=6) were illiterate, 17% (n=50) had completed primary studies, 21.4 %(n=63) has completed secondary studies, 33.3% (n=98) has completed higher secondary and 26.2% (n=77) completed graduation and further studies .This study show that Among the participants, 12 .2% (n=36) were students,10.9% (n=32) were private service holder ,18.4% were government service holder,17.3% (n=51) were businessman,36.4%(n=107) were unemployed and 4.8% (n=14) were from others occupations. Which means most of the participants occupation were business.

In this study Among the 294 participants, 82.3% (n=242) were Married, 13.6% (n=40)were unmarried, 3.7 %(n=11) were widow/widower and 0.3% (n=1) take divorce. Among those participants 2 family has 3 member,22 family has 4 member,99 family has 5 member,84

family has 6 member,57 family has 7 member,20 family has 8 member,6 family has 9 member and 4 family has 10 member. Study show that maximum family member were 10 and minimum family member were 3.

Among 294 participants 0.3% were Asymptomatic,66% were symptomatic independent,25.9% were symptomatic and needed assistance,4.4% became hospitalized but no needed oxyzen therapy,2% became hospitalized and needed oxyzen by mask or nasal prongs and 1.4 became hospitalized and needed oxyzen by NIB or high flow. which means maximum 92.3% particpants had mild disease. According to WHO working group classification,26 63.2% (n=1390) of the acute COVID-19 symptoms had mild COVID, 23.7% (n=520) had moderate COVID and 0.4% (n=8) had severe COVID-19 (Marshal et al.,2020). This study show that the severity of disease is lower than WHO working group classification.

This study shows that Among participants only 7.8%(n=23) were needed to admitted to the hospital and most of them 92.8%(n=271) didn't required to admitted to hospital. Among all participants 92.2% (n=273) took medicine for recovery , 3.4%(10) needed ventilation and 3.7%(n=11) needed oxyzen supplementation. Another study of Bangladesh shows that 5.7% (n=126) needed supplementary oxygen either at home or hospital (Hossain et al.,2021). Which is markly higher than this study. In this study 23.1%(n=68) received 2nd dose of Vaccination and 76.9%(n=226) were received Booster dose of Vaccination.

In this study Among participants about 30.30% participants has at least one Co-morbidity and other 69.70% participants has no Co-morbidity. Among the Participants 26 Participants has at least 1 Co morbidity, 23 Participants has at least 2 Co morbidity, 22 participants has at least 3 Co morbidity, 15 participants has at least 4 Co morbidity, 2 participants has 5 Co morbidity and 1 participants has 6 Co morbidity. Among the positive Co-morbidity participants 7 participants has heart disease,40 participants has high blood pressure,11 participants has lung disease,38 partipants has diabetes,1 participants has anaemia,1 participants has depression,44 participants has osteoarthritis,71 participants has backpain, and 1 participants has rheumatoid arthritis. Another study shows that The most

common comorbidity was hypertension (42.1%), followed by diabetes mellitus (16.3%) and mild intermittent asthma (7.3%). There were no reported comorbidities in 21.9% patients (lane et al.,2022).But this study shows that most common comorbidity was Backpain.

In this study during acute COVID 19 affected time among the participants 88.8% participants had fever,67.0% had cough,75.20% had fatigue, 9.9 % had sputum,47.30% had Headache, 11.60% had diarrhea, 2.40 % had Myalgia, 68.70% had Shortness of breathing, 40.10% had Sore throat, 3.70% had Nausea,4.40% had Chill, 16.00% had Runny nose, 50.3% had anorexia, 16% had dizziness,77.2% had anosmia, 87.1% had Body pain and 0.70% were asymptomatic. Another Bangladeshi study shows that the most common symptoms were fever 76.6% (n=1683), fatigue 50.1% (n=1101), cough and upper respiratory tract symptoms 65.4% (n=1438), dyspnea 23.8% (n=523), pain 33.1% (n=727), headache 38% (n=836) and anosmia 43.9% (n=966)(Hossain et all,2021).

After 12 weeks Among the long COVID patients 2.20 % has Cough ,69.60% has Fatigue, 10.9% has Headache,15.2% has Shortness of breathing, 8.7 % has Anorexia, 2.2% has Dizziness, 13 % has anosmia,41.30% has Body pain, and 15.20% has other symptoms. Another study shows that After 12 weeks, long COVID symptoms presented as fatigue 82.9% (n=295), cough and upper respiratory tract symptoms 8.7% (n=31), dyspnea 10.4% (n=37), pain 16.9% (n=60), chest pain .3% (n=1), ageusia 3.4% (n=12), headache 2.2% (n=8) and anosmia 5.1% (n=18). Fatigue was the prominent long COVID-19 symptoms.(Hossain et al.,2021)

In Fisher exact test association in between Age group and Modified Brief Pain Inventory Questionnaire showing that their p value higher than 0.05. So all are insignificant. That means there is no relation between age and modified brief pain inventory questionnaire and association in between Age group and Modified Brief fatigue Inventory Questionnaire showing that their p value also higher than 0.05. So all are insignificant. That means there is no relation between age and modified brief pain inventory questionnaire. Correlations between sex and average pain severity. In Fisher Exact test their FET value is 6.899 and p value is 0.023 which is significant; Correlations between sex and pain interfered general activity during the past 24 hours. In Fisher Exact test their FET value is 7.545 and p value

is 0.014 which is significant; Correlations between sex and pain interfered mood during the past 24 hours. In Fisher Exact test their FET value is 7.430 and p value is 0.014 which is significant; Correlations between sex and pain interfered walking ability during the past 24 hours. In Fisher Exact test their FET value is 8.651 and p value is 0.008 which is significant. That means there is a relation with sex with modified brief pain inventory. Correlations between sex and average fatigue severity. In Fisher Exact test their FET value is 12.482 and p value is 0.002 which is significant; Correlations between sex and fatigue interfered general activity during the past 24 hours. In Fisher Exact test their FET value is 11.514 and p value is 0.002 which is significant; Correlations between sex and fatigue interfered mood during the past 24 hours. In Fisher Exact test their FET value is 12.317 and p value is 0.001 which is significant; Correlations between sex and fatigue interfered walking ability during the past 24 hours. In Fisher Exact test their FET value is 13.345 and p value is 0.001 which is significant; Correlations between sex and fatigue interfered normal work during the past 24 hours. In Fisher Exact test their FET value is 12.317 and p value is 0.001 which is significant; Correlations between sex and fatigue interfered sleep during the past 24 hours.In Fisher Exact test their FET value is 17.737 and p value is 0.000 which is significant. Correlations between sex and fatigue interfered sleep during the past 24 hours.In Fisher Exact test their FET value is 17.737 and p value is 0.001 which is significant. That means there is a relation with sex with modified fatigue inventory.

In Fisher exact test association in between vaccinated group and Modified Brief Pain Inventory Questionnaire showing that their p value higher than 0.05. So all are insignificant. That means there is no relation between vaccinated group and modified brief pain inventory questionnaire. In Fisher exact test association in between vaccinated group and Modified Brief fatigue Inventory Questionnaire showing that their p value higher than 0.05. So all are insignificant. That means there is no relation between vaccinated group and modified brief pain inventory questionnaire.

Correlations between Comorbidities and average pain severity. In Fisher Exact test their FET value is 14.697 and p value is 0.026 which is significant; Correlations between Comorbidities and pain interfere general activity during past 24 hours. In Fisher Exact test their FET value is 19.448 and p value is 0.004 which is significant; Correlations between

Comorbidities and pain interfere mood during past 24 hours. In Fisher Exact test their FET value is 14.471 and p value is 0.50 which is significant; Comorbidities and pain interfere walking ability during past 24 hours. In Fisher Exact test their FET value is 22.065 and p value is 0.001 which is significant; Correlations between Comorbidities and pain interfere normal work during past 24 hours. In Fisher Exact test their FET value is 10.735 and p value is 0.014 which is significant; Correlations between Comorbidities and pain interfere sleep during past 24 hours. In Fisher Exact test their FET value is 19.448 and p value is 0.004 which is significant. That means there is a relation with co morbidities with modified pain inventory. In Fisher exact test association in between Comorbidities and Modified Brief fatigue Inventory Questionnaire showing that their p value higher than 0.05. So all are insignificant. That means there is no relation between Comorbidities and modified brief fatigue inventory questionnaire.

Limitation of the study

 The main limitation was that we didn't found enough patients with Covid-19 because of the patient's unwillingness to provide information.

 Many patients hesitate to recognize Covid-19 because they are still terrified of the negative implications of Covid-19.

 It was unable to extrapolate the findings of this research because the sample size was too small. Research was limited to Savar upazila, Dhaka,Bangladesh.

 This study was performed in a short time, thus all factors related to long COVID may not have been emphasized. If there was adequate time, the scope of this project may be expanded.

 The researcher was a 4th year B.Sc. in physiotherapy student and this was his first research project. She had limited experience with techniques and strategies in terms of the practical aspects of research. As it was the first survey of the researcher so might be there were some mistakes that overlooked by the researcher.

CHAPTER 6 CONCLUSION AND RECOMMENDATION

In general, from this study can be concluded that the current understanding of long COVID, a relatively new and puzzling condition that may affect COVID-19 survivors, regardless of initial disease severity or age. In this study, the prevalence of long COVID symptoms was identified to be 15.6% after 12 weeks post diagnosis of people lives at Savar upazila, Dhaka, Bangladesh. The severity of symptoms and their co-relation have been discussed. In addition, the study identified some COVID related information like severity, medication status ,vaccination status, Socio demographic status and co morbidity.

However, much concerning long COVID remains uncertain, especially its risk factors, which are based on conflicting data. This may be due to its multiple symptomatic presentations and pathophysiology's.

Evidently, the pandemic has brought us a wave of a new chronic, disabling condition called long COVID that deserves serious attention among the scientific and medical communities to resolve. Assuming at least 10% of COVID-19 survivors develop long COVID, which is likely underestimated, it is estimated that 5 million people are facing long COVID globally (Altmann et al.,2021). The information presented in this review, which has not been communicated extensively elsewhere in the literature, may serve as a starting point for further exploration on long COVID.

Recommendation

- A large proportion of COVID-19 positive patients should be a focus of future research.
- Researchers may conduct research throughout Bangladesh to better serve persons with COVID-19 positive.
- Cohort follow-up study should be focus on future study
- Further research is needed to gain about risk factor, duration of symptom, treatment of this long COVID and what can be done to support communities affected by it.

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APPENDIX

INFORMED CONSENT

(Please read out to the participants)

Assalamualaikum/Namasker, my name is Tamzid Hossain, I am conducting this study for a B.Sc in Physiotherapy project study dissertation titled "**Characteristics of Long COVID Symptoms of people affected by COVID-19 living at Savar Upzilla ,Dhaka ,Bangladesh**" under Bangladesh Health Professions Institute (BHPI), University of Dhaka. I would like to know about some personal and other related information regarding covid-19 disease. You will perform some tasks which are mention in this form. This will take approximately 20-30 minutes.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. The researcher is not directly related with study, so your participation in the research will have no impact on your present or future treatment in this area (long covid-19). All information provided by you will be treated as confidential and in the event of any report or publication it will be ensured that the source of information remains anonymous and also all information will be destroyed after completion of the study. Your participation in this study is voluntary and you may withdraw yourself at any time during this study without any negative consequences. You also have the right not to answer a particular question that you don't like or do not want to answer during interview.

Do you have any questions before I start?

So, may I have your consent to proceed with the interview or work?

1. Yes 2.No

Signature/Finger print of the Participant: Date:

Signature of the Researcher: Date:

Signature/Finger print of the witness: Date:

সম্মতিপত্র

আসসালামুয়ালাইকুম,

আমি তামজিদ হোসেন , বাংলাদশ হেলথ প্রফেশন্স ইন্সটিটিউট এর বি.এস.সি ইন ফিজিওথেরাপি কোর্সের ৪র্থ বর্ষের একজন শিক্ষার্থী। অধ্যায়নের অংশ হিসেবে আমাকে একটি গবেষণা সম্পাদন করতে হবে এবং এটা আমার প্রাতিষ্ঠানিক কাজের একটা অংশ। নিম্নোক্ত তথ্যাদি পাঠ করার পর অংশগ্রহণকারীদের গবেষণায় অংশগ্রহনের জন্য অনুরোধ করা হলো।

আমার গবেষণার বিষয় হল **'বাংলাদেশের ঢাকা জেলার অন্তর্ভুক্ত সাভার উপজেলায় বসবাসকারী কোভিড-১৯ আক্রান্ত ব্যক্তিদের দীর্ঘকালীন কোভিড উপসর্গের বৈশিষ্ট্যসমূহ।'** এই পরীক্ষামূলক গবেষণার মাধ্যমে আমি কোভিড-১৯ আক্রান্ত ব্যক্তিদের দীর্ঘকালীন কোভিড উপসর্গের বৈশিষ্ট্যসমূহ নিরূপণের একটি অনুমান পরীক্ষা করব।

আমি যদি আমার গবেষণাটি সার্থকভাবে সম্পূর্ণ করতে পারি তবে যেসব ব্যক্তিরা কোভিড-১৯ আক্রান্ত হয়েছেন বা ভবিষ্যতে হবে তারা উপকৃত হবেন এবং এটি হবে একটি পরীক্ষামূলক প্রমাণ। গবেষণাটি সম্পাদনের জন্য, আমার তথ্য সংগ্রহ করা প্রয়োজন হবে। গবেষণার ক্ষেত্র বিবেচনা করে আপনার মাঝে আমার গবেষণায় অংশগ্রহণ করার জন্য প্রয়োজনীয় বৈশিষ্ট্য লক্ষ্য করা গেছে। এজন্য, আপনি আমার গবেষণার একজন সম্মানিত অংশগ্রহণকারী হতে পারেন এবং আমি আপনাকে আমার গবেষণায় অংশগ্রহন করতে অনুরোধ জানাচ্ছি।

আমি প্রতিজ্ঞা করছি যে, এই গবেষণা আপনার জন্য ঝুঁকিপূর্ণ হবে না অথবা আপনার কোন ক্ষতি করবে না।গবেষণা চলাকলীন সময়ে কোন রকম দ্বিধা বা ঝুঁকি ছাড়াই যেকোন সময়ে আপনি এটাকে বাদ দিতে পারবেন। এই গবেষণার প্রাপ্ত তথ্য সম্পূর্ণভাবে গোপনীয় থাকবে এবং অংশগ্রহণকারীর ব্যক্তিগত তথ্য অন্য কোথাও প্রকাশ করা হবে না।যদি আপনার গবেষণা সম্পর্কে কোনো জিজ্ঞসা থাকে তবে আপনি অনুগ্রহপূবক যোগাযোগ করতে পারেন গবেষক তামজিদ হোসেন অথবা আমার সুপারভাইজার এসোসিয়েটস প্রফেসর মোঃ আনোয়ার হোসেন, বিভাগীয় প্রধান , ফিজিওথেরাপি বিভাগ, সিআরপি, সাভার, ঢাকা- ১৩৪৩ ।

শুরু করার আগে আপনার কি কোন প্রশ্ন আছে ?

আমি কি শুরু করতে পারি ?

হ্যাঁ / না

অংশগ্রহনকারীর স্বাক্ষর.....
তারিখ……

সাক্ষীর স্বাক্ষর.....
তারিখ……

তথ্য সংগ্রহকারীর স্বাক্ষর..... তারিখ……

Questionnaire Sheet

Research Title

"Characteristics of Long COVID Symptoms of people affected by COVID-19 living at Savar Upazila,Dhaka,Bangladesh".

Part-1: Patient's Identification (To be collected from medical record/respondent)

1.1	GC of respondent/Lab Identification number	
1.2	Date of Interview	
1.3	Name of respondent	
1.4	Address	
1.5	Contact number	

Part-2: Socio-demographic and Anthropometric Information (To be collected from medical record/respondent)

QN	Question and Filters	Response
2.1	Age	
2.2	Gender (Put √ on your answer)	1. Male 2. Female
2.3	Educational Status (Put √ on your answer)	1. No formal education 2. Primary education 3. Secondary Education 4. Higher secondary 5. Bachelor or above

2.4	Marital Status (Put √ on your answer)	1. Married 2. Unmarried 3. Widow/widower 4. Divorcee
2.5	Occupation (Put √ on your answer)	1. Student 2. Private Service 3. Government Service 4. Business 5. Unemployed 6. Others: ……
2.6	Living Area (Put √ on your answer)	1=Rural 2=Semi Urban 3=Urban
2.7	Family member (Please write)	
2.8	Monthly Family Income (Please write)	……BDT

Part-3: Covid-19 related information:

3.1	When did you diagnose COVID positive? (Please write the date)	
3.2	How long you were in isolation? (Please write)	……..…….. day
3.3	Had you been admitted to the hospital?	1= Yes

	(Put √ and write your answer)	2= No (if yes, mention the duration…… days)
3.4	Days from symptom onset to hospital admission (Please write your answer)	……. Days
3.5	What kinds of treatment you have received during COVID-19 status?	1= Medicine 2= Ventilation 3= Oxygen supplementation
3.6	Do you have vaccination of COVID-19 ?	1= Yes, Completed 1 dose 2= Yes, completed 2 doses 3=yes, completed Booster dose 4= No, I haven't vaccinated yet.

Part-4: WHO Clinical Progression scales-

Patient States	Descriptor	Score
Uninfected	Uninfected; no viral RNA detected	0
Ambulatory mild disease	Asymptomatic; viral RNA detected	1
	Symptomatic; independent	2
	Symptomatic; assistance needed	3
Hospitalized: moderate disease	Hospitalized; no oxygen therapy	4
	Hospitalized; oxygen by mask or nasal prongs	5
Hospitalized: severe diseases	Hospitalized; oxygen by NIV or high flow	6
	Intubation and mechanical ventilation, pO2/FiO2 ≥150 or SpO2/FiO2 ≥200	7
	Mechanical ventilation pO2/FIO2,<150 (SpO2/FiO2<200) Or Vasopressors.	8
	Mechanical ventilation pO2/FiO2, <150 and Vasopressors,Dyalisis or ECMO	9
Dead	Dead	10

Part-5 :The Self-Administered Co morbidity Questionnaire-

PROBLEM	Do you have the problem?		Do you receive treatment for it?		Does it limit your activities?	
	No (0)	Yes→ (1)	No (0)	Yes (1)	No (0)	Yes (1)
Heart disease	N	Y	N	Y	N	Y
High blood pressure	N	Y	N	Y	N	Y
Lung disease	N	Y	N	Y	N	Y
Diabetes	N	Y	N	Y	N	Y
Ulcer or stomach disease	N	Y	N	Y	N	Y
Kidney disease	N	Y	N	Y	N	Y
Liver disease	N	Y	N	Y	N	Y
Anemia or other blood disease	N	Y	N	Y	N	Y
Cancer	N	Y	N	Y	N	Y
Depression	N	Y	N	Y	N	Y
Osteoarthritis, degenerative arthritis	N	Y	N	Y	N	Y
Back pain	N	Y	N	Y	N	Y
Rheumatoid arthritis	N	Y	N	Y	N	Y
Other medical problems (please write in)						
	N	Y	N	Y	N	Y
	N	Y	N	Y	N	Y

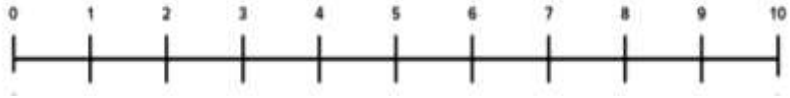
Part-6: Symptoms during covid 19 affected time and symptoms right now-

Symptoms	During Covid-19 affected time (YES/NO)		Right now (YES/NO)	
6.1 Fever				
6.2 Cough				
6.3 Fatigue				
6.4 Sputum production/Expectoration				
6.5 Headache				
6.6 Diarrhea				
6.7 Myalgia				
6.8 Shortness of breath				
6.9 Sore throat/ Pharyngalgia				
6.10 Nausea or vomiting				
6.11 Chill				
6.12 Runny nose (Rhinorrhoea)				
6 .13 Dyspnea				
6 .14 Anorexia				
6 .15 Dizziness				
6 .16 Anosmia				
6 .17 Body Pain				

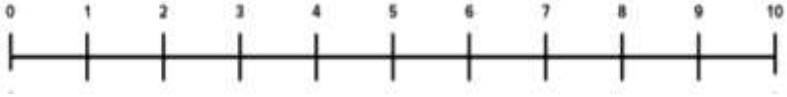
6 .18. Asymptomatic				
Others				
6.19				
6.20				
6.21				

Part-7:Modified Breif pain Inventory(Short form)

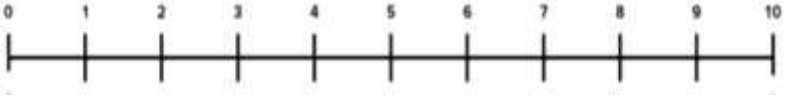
7.1 Please rate your pain by circling the one number that best describes your pain at its **worst** in the last 24 hours**.**

No pain  Worst pain imaginable

7.2 Please rate your pain by circling the one number that best describes your pain on the **average.**

No pain  Worst pain imaginable

7.3 Please rate your pain by circling the one number that tells how much pain you have **right now.**

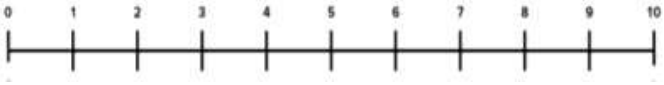
No pain  Worst pain imaginable

7.4 In the last 24 hours, how much relief have pain treatments or medications provided? Please circle the one percentage that shows how much **relief** you have received.

No relief - 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100% - Complete relief

7.5 Circle the one number that describes how, during the past 24 hours, pain has **interfered** with your:

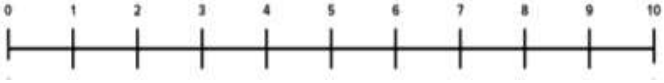
A. General activity

Does not interfere  Completely interferes

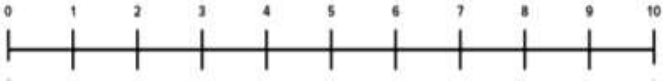
B. Mood

Does not interfere  Completely interferes

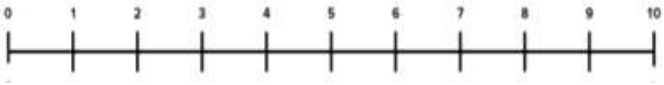
C. Walking ability

Does not interfere  Completely interferes

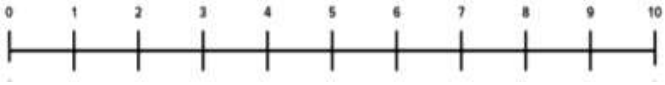
D. Normal work (includes both work outside the home and housework)

Does not interfere  Completely interferes

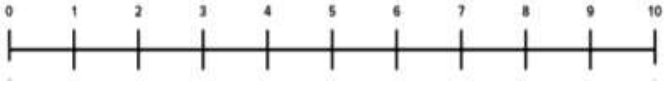
E. Relations with other people

Does not interfere  Completely interferes

F. Sleep

Does not interfere  Completely interferes

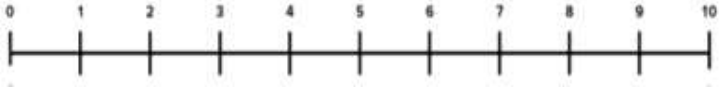
G. Enjoyment of life

Does not interfere  Completely interferes

Part-8: Modified Brief Fatigue Inventory

Throughout our lives, most of us have times when we feel very tired or fatigued.

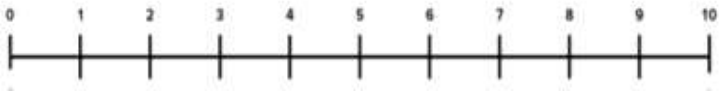
8.1 Please rate your fatigue (weariness, tiredness) by circling the one number that best describes your fatigue right NOW.

No fatigue  As bad as you can imagine

8.2 Please rate your fatigue (weariness, tiredness) by circling the one number that best describes your USUAL level of fatigue during past 24 hours.

No fatigue  As bad as you can imagine

8.3 Please rate your fatigue (weariness, tiredness) by circling the one number that best describes your WORST level of fatigue during past 24 hours.

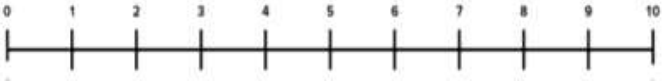
No fatigue  As bad as you can imagine

8.4 Circle the one number that describes how, during the past 24 hours, fatigue has interfered with your:

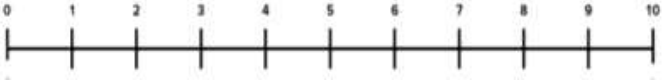
A. General activity

Does not interfere  Completely interferes

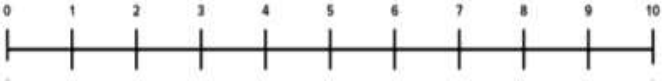
B. Mood

Does not interfere  Completely interferes

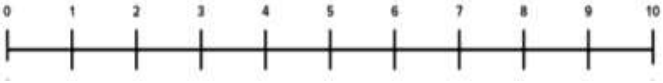
C. Walking ability

Does not interfere  Completely interferes

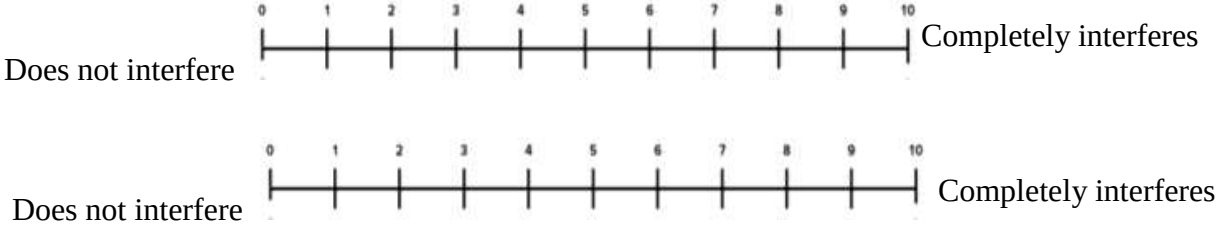
D. Normal work (includes both work outside the home and housework)

Does not interfere  Completely interferes

E. Relations with other people

Does not interfere  Completely interferes

F. Sleep



Date :

Signature of the Investigator

বাংলাদেশ হেল্‌থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
Bangladesh Health Professions Institute (BHPI)
(The Academic Institute of CRP)

Ref: CRP/BHPI/IRB/03/2022/564

Date: 02/03/2022

Tamzid Hossain
4th Year B.Sc. in Physiotherapy
Session: 2016 – 2017
BHPI, CRP, Savar, Dhaka- 1343, Bangladesh

Subject: Approval of the research project proposal **"Characteristics of Long COVID Symptoms of people affected by COVID-19 living at Savar Upzilla, Dhaka, Bangladesh"** by ethics committee.

DearTamzid Hossain,
Congratulations.
The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above-mentioned dissertation, with yourself, as the principal investigator and Mohammad Anowar Hossain as thesis supervisor. The Following documents have been reviewed and approved:

Sr. No.	Name of the Documents
1	Dissertation Proposal
2	Questionnaire (English version)
3	Information sheet & consent form.

The purpose of the study is to be addressed the characteristics of long COVID symptoms which are crucial for development of treatment and prevention of poor outcomes after acute SARS-CoV-2 infection. Since the study involves questionnaire that takes maximum 10-15 minutes and have no likelihood of any harm to the participants, the members of the Ethics committee approved the study to be conducted in the presented form at the meeting held at 09:00 AM on 12th October, 2021 at BHPI (30th IRB Meeting).

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring in the course of the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,

Muhammad Millat Hossain
Assistant Professor, Dept. of Rehabilitation Science
Member Secretary, Institutional Review Board (IRB)
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

বাংলাদেশ হেল্‌থ প্রফেশন্স ইনষ্টিটিউট (বিএইচপিআই)
BANGLADESH HEALTH PROFESSIONS INSTITUTE (BHPI)
(The Academic Institute of CRP)
CRP-Chapain, Savar, Dhaka, Tel: 02224445464 , 02224441404, Website: www.bhpi.edu.bd

Date: 22.03.2022

To
Health and Family Planning Officer
Savar Upazila,
Savar, Dhaka.

DR. MD. SHAYEKUL HUDA
UPAZILA HEALTH & FAMILY PLANNING OFFICER
SAVAR, DHAKA.
BMDC REG. A-54939

Subject: *Regarding Data collection for dissertation.*

Greetings from Bangladesh Health Professions Institute (BHPI). I would like to inform you that, BHPI, the Academic Institute of CRP is running B. Sc in Physiotherapy Course, under Faculty of Medicine, University of Dhaka.

According to the content of 4th year of University course curriculum, the students have to do Research and Course work in different topics to develop their skills. Considering the situation, your institute will be the most appropriate place to collect data.

4th year students of BHPI Shahid Afridi would like to collect data in your organization in your convenient time.

We shall remain grateful to you if you could kindly allow us in conducting the placement.

With regards

Md. Shofiqul Islam
Associate Prof. & Head
Dept. of Physiotherapy
BHPI