



Faculty of Medicine
University of Dhaka

**KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING
LONG COVID AMONG HEALTH PROFESSIONALS**

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

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Submitted by **Razwana Tasnim Runa** for partial fulfilment of the requirements for the degree of Bachelor of Science in Physiotherapy (B.Sc. PT).

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Declaration

I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also decline that same any publication, presentation or dissemination of information of the study. I would be bound to take written consent from Department of Physiotherapy, Bangladesh Health Professions Institute (BHPI).

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CONTENTS

	Page No
Acknowledgement	i
Acronyms	ii
List of Tables	iii
Abstract	iv
CHAPTER-I: INTRODUCTION	1-7
1.1 Background	1-2
1.2 Rationale	3
1.3 Research question	4
1.4 General objectives	5
1.5 Specific objectives	5
1.6 List of variables	6
1.7 Operational definition	7
CHAPTER-II: LITERATURE REVIEW	8-11
CHAPTER-III: METHODOLOGY	12-21
3.1 Study design	12
3.2 Study area	12
3.3 Study population	12
3.4 Sampling technique	12
3.5 Inclusion criteria	13
3.6 Exclusion criteria	13
3.7 Sample size calculation	14
3.8 Sample size	14
3.9 Data collection tools	14
3.10 Questionnaire	15
3.11 Data collection Procedure	16
3.12 Data analysis	17
3.13 Determination of nature of data	18-19
3.14 Determination of statistical test	20
3.15 Ethical consideration	21
CHAPTER-IV: RESULTS	22-41

CHAPTER-V: DISCUSSION	42-46
5.1 Discussion	42-45
5.2 Limitation	46
CHAPTER-VI: CONCLUSION AND RECOMMENDATION	47-48
6.1 Conclusion	47
6.2 Recommendation	48
REFERENCES	49-53
APPENDIX	54-62
Verbal consent form (English)	54
Questionnaire (English)	55-58
Permission letter	59-62

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Acronyms

BHPI	Bangladesh Health Professions Institute
CRP	Centre for the Rehabilitation of the Paralysed
EMCH	Enam Medical College Hospital
IRB	Institutional Review Board
KAP	Knowledge, Attitude and Practices
WHO	World Health Organization

List of Tables

	Page No
Table-1: Normality test for different variable	18-19
Table-2: Inferential Statistical Test	20
Table-3: Socio-demographic chart with frequency, percentage, mean & SD	22
Table-4: COVID related experience with frequency, percentage, mean & SD	24-25
Table-5: Knowledge, Attitude & Practice with frequency, percentage, mean & SD	26
Table-6: Association between dependent (Knowledge score) variable with the independent variable (socio demographics)	28
Table-7: Association between dependent (Attitude in self- care and mobility issue) variable with the independent variable. (Socio demographics)	30
Table-8: Association between dependent (Attitude in Long COVID rehabilitation) variable with the independent variable. (Socio demographics)	32
Table-9: Association between dependent (Attitude for Cure of Long COVID Symptoms) variable with the independent variable (Socio demographics)	34
Table-10: Association between dependent (Practice regarding patient education) variable with the independent variable (Socio demographics)	35
Table-11: Association between dependent (Practice regarding Monitoring Heart rate) variable with the independent variable (Socio demographics).	36
Table-12: Association between dependent (Practice Stop-rest-pace Approach) variable with the independent variable (Socio demographics)	38
Table-13: Association between dependent (Practice regarding check post exertion symptoms) variable with the independent variable (Socio demographics)	40
Table-14: Binary regression of knowledge parameter with other predictor variables	41

Abstract

Background: People living with Long COVID from all over the world describe it as a complicated, multi-faceted condition with a wide range of physical, cognitive, psychological, and social implications which is a growing health concern. Health professional's Knowledge, Attitude and Practice involves a variety of perspectives on the disease's origins and aggravating factors, the recognition of symptoms, accessible therapeutic options, and potential outcomes. **Objectives:** To evaluate the knowledge attitude and practice regarding long COVID among health professionals. **Methods:** A cross-sectional study design was selected for this study with a self-structured questionnaire from April 2022 to May 2022. **Tools:** Self-structured questionnaire consisting of five parts including socio demographic, COVID related experience, knowledge, attitude and practice. **Statistical tools:** Statistical analysis was performed in SPSS version 20 and Microsoft Office Excel 2013 according to the nature of data. **Results:** In this study mean knowledge score of health professionals was 6.17 out of 10, and the standard deviation was 1.872, Knowledge regarding Long COVID was poor among 7.2% health professionals, Good among 48.4% health professionals and Excellent among 44.4% health professionals and Knowledge was associated with age, gender, profession, education and work position. Binary logistic regression showed that, Health Professionals who have good knowledge about Long COVID has positive Attitude and sound Practice over Long COVID. **Conclusion:** This study postulated that increasing Knowledge of Long COVID will help to consolidate attitude toward Long COVID and induce suitable practice for Long COVID. Therefore, a larger study including health experts from all around Bangladesh should be conducted.

Keyword: KAP, Long COVID, Health Professionals.

Word Count: 10644

1.1 Background

A considerable number of persons continue to have symptoms following the acute period of COVID-19 infection, which is known to as long COVID (Michelen et al., 2021). After the fourth week of recovering from an acute illness, patients may experience new or continuing symptoms that cannot be explained by a different medical diagnosis. These symptoms are referred to clinically as long COVID or post COVID-19 symptoms (Perego et al., 2020). The persistence of symptoms or the presence of new symptoms associated with SARS-CoV-2 infection late in the course of COVID-19 is a rising concern for the global afflicted population and its health-care systems. Long-COVID' or 'COVID long-haulers' are persons who have COVID-19 and have symptoms for more than 28 days after diagnosis, whether laboratory verified or clinical. Symptoms are as many as those observed in acute COVID-19 and can be constant, variable, or appear and be replaced by symptoms from other systems with varying frequency (Mendelson et al., 2021). The World Health Organization has estimated their clinical case definition of Post COVID-19 conditions that occur in individuals with a history of probable or confirmed SARS-COV-2 infection that occurs three months after the onset of COVID-19 and symptoms last at least two months and cannot be explained by another diagnosis. The most common symptoms are fatigue, shortness of breath, and cognitive impairment, but there are others that have an influence on daily functioning. Symptoms may appear after recovering from an acute COVID-19 episode or may persist from the initial illness. Symptoms may also fluctuate or reappear (WHO, 2021). Female gender, older age, and active smoking were found to be connected with a higher likelihood of developing "long COVID" syndrome, but not the severity of the acute disease (Bai et al., 2022). An older age, female gender, hospital admission at symptom onset, initial dyspnea, chest pain, abnormal auscultation findings (sounds from the heart, lungs, or other organs), and symptom load during the acute phase, and co-morbidities, particularly asthma, were found to be significantly associated with an increased risk of developing persistent symptoms (Aiyegbusi et al., 2021). The impact of acute COVID-19 on individuals, regardless of severity, goes beyond hospitalization in severe cases to persistent impairment of quality of life, mental health, and employment issues (Jacobs et al., 2020). In a study it is reported that Patients' capacity

to engage in social activities is impaired 4–6 weeks after hospitalization (Weerahandi et al., 2021). Long-term respiratory issues, persistent fatigue, and patients may also have difficulty with attention and memory, as well as psychological or neurological consequences, are becoming increasingly common among patients after resolution of the initial SARS-CoV-2 infection (Logue et al., 2021). Persistent symptoms are significantly associated with worse long-term health condition, reduced quality of life, and psychological distress (Han et al., 2022). A global survey of persons with long COVID discovered a wide range of symptoms that lasted months and caused severe disability. (Davis et al., 2021). Many survivors of Long COVID-19 Syndrome have multi-organ damage. Thus, early detection, treatment, and rehabilitation through multidisciplinary collaboration are essential for their recovery and quality of life enhancement (Cherneva & Cherneva, 2022). With the re-emergence of mass influx of SARS-CoV-2 infection across many countries, the burden of patients with long-term COVID-19 sequels is predicted to be massive, resulting in a new public health emergency on the heels of the COVID 19 pandemic (Garg et al., 2021). Despite widespread COVID-19 vaccination, infection rates are still high. To make treatment easier for recovered COVID-19 patients, it's crucial to recognize the long-term impacts and consequences (Cherneva & Cherneva, 2022). Understanding the rapidity with which new symptoms and illnesses develop in the months following SARS-CoV-2 infection is fundamental for informing patients' recovery expectations and allowing health care practitioners and health systems to address patients' needs (Nalbandian et al., 2021). COVID-19 has long-term detrimental health and economic implications over the planet. Even among healthcare workers, there is a lack of knowledge of the Long-COVID-19 case situations. As a result, it is necessary to emphasize this growing clinical entity, raise knowledge of it among health professionals, and establish and improve healthcare facilities to manage the disease's imprints in recovered individuals (Garg et al., 2021). To ensure efficient and effective solutions to future health concerns, sustainable healthcare systems are essential (Aiyegbusi et al., 2021). KAP is an essential cognitive factor in the prevention and promotion of health in the field of public health. It involves a variety of perspectives on the disease's origins and aggravating factors, the recognition of symptoms, accessible therapeutic options, and potential outcomes (Szymona-Pałkowska et al., 2016).

1.2 Rationale

People living with Long COVID from all over the world describe it as a complicated, multi-faceted condition with a wide range of physical, cognitive, psychological, and social implications. Long COVID symptoms reported by patients is extensive that can be considered as a second pandemic as a sequel of COVID 19 pandemic. It is going to be a huge public health crisis globally which is a growing health concern. World need to ensure the strengthening of health systems to be able to provide treatment, support and rehabilitation to improve long-term COVID-19 outcomes. It is important to maximize the health professional's ability to deliver evidence-based solutions to the long-term effects of COVID-19. Currently, the knowledge of Long-COVID-19 is sparse in most aspects even in health care professionals. To develop holistic care pathway for rehabilitation, interventions and social support systems for long COVID and to prevent Long COVID symptoms there is an urgency to have sufficient knowledge of health professionals about long COVID, conspicuous attitude toward long COVID and suitable practice for long COVID. We need to ensure the health professionals knows about the potential 'Long COVID' consequences of symptoms, they have a positive Attitude toward the pursuance of Long COVID Symptoms and have evidence-based practice of Long COVID Symptoms. Determining knowledge, attitudes and practices (KAP) will provide a glimpse of how health professionals are responding to this emerging clinical entity as long COVID symptoms has to remain a global priority. To the best of our knowledge this is the first study to include objective to evaluate the knowledge attitude and practice regarding long COVID among health professionals.

1.3 Research Question

What is the level of knowledge, Attitude and Practice regarding long COVID among health professionals?

1.4 General Objective

To evaluate the knowledge attitude and practice regarding long COVID among health professionals.

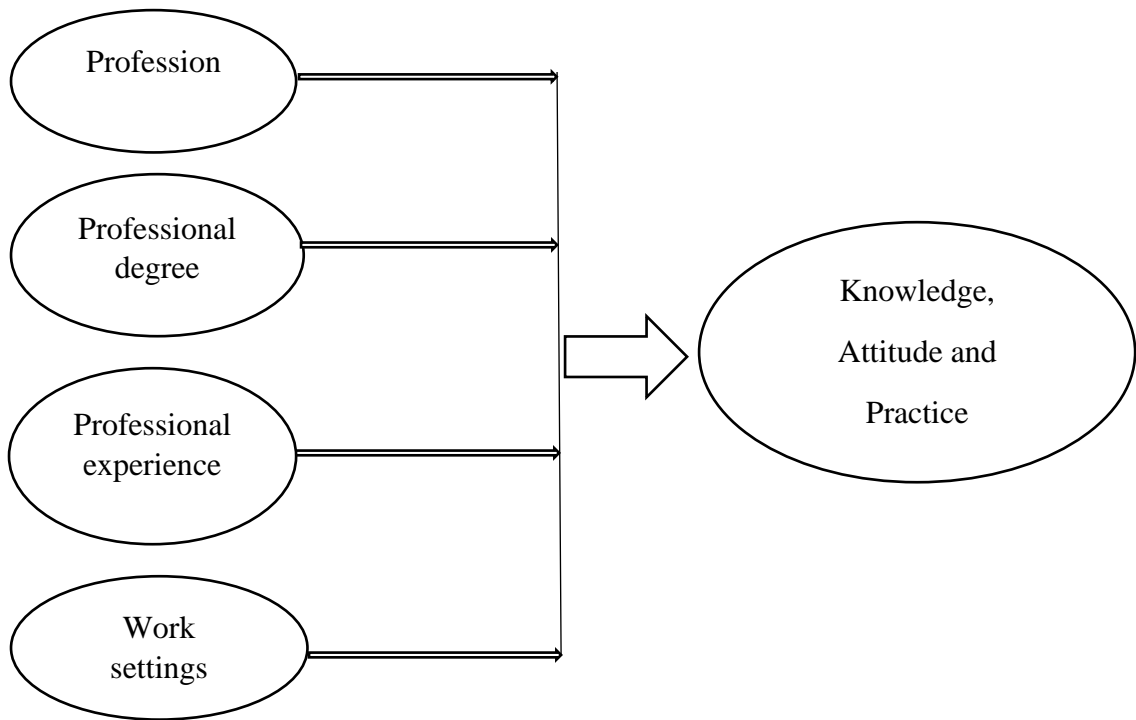
1.5 Specific Objectives

1. To demonstrate a socio demographic chart of the participants.
2. To find COVID related information of the participants.
3. To determine knowledge in relation to long COVID among health professionals.
4. To explore attitude towards treatment and prevention for long COVID in health professionals.
5. To ascertain practice in relation to long COVID of health professionals.
6. To find out relationship of knowledge with socio demographic variables among health professionals.
7. To evaluate relation of socio demographic variables with Attitude toward long COVID among health professionals.
8. To see relation of socio demographic variables with practice regarding long COVID among health professionals.
9. To see association between categorical dependent variables and predictor variables.

1.6 List of Variables

Independent variables

Dependent variable



1.7 Operational Definition

Long COVID: Persistent symptoms following an acute SARS-COV-2 infection which lasts for more than 12 weeks and cannot describe by any other medical diagnosis is called Long COVID.

Knowledge: Knowledge refers to understanding the characteristics of Long COVID symptoms, associated risk factors and complications by the health Professionals.

Attitude: Feelings of the participants in regard to Long COVID or beliefs concerning the prevention and management of Long COVID symptoms.

Practice: The actions taken by the health professionals which demonstrate their knowledge and attitude toward long COVID.

Health Professionals: Who provides health care, treatment and advice to patients including Physician, Nurse, Physiotherapist, Occupational Therapist, Speech and Language therapist, Prosthetist and Orthotist.

The term "Long COVID" refers to disease in persons who have either recovered from covid-19 but are still experiencing long-lasting consequences from the infection or had experienced the typical symptoms for much longer than one could anticipate (Mahase, 2020).

In Bangladesh the largest cohort study for long COVID prevalence has reported that prevalence for the long COVID symptoms was 22.5 percent at 4 weeks and 16.1 percent at 12 weeks following diagnosis (Hossain et al., 2021).

Another prospective cohort study in a tertiary care center of Bangladesh has reported that, among 355 recruited participants in total, 46% of respondents experienced post-COVID-19 symptoms, particularly post-viral fatigue being one of the most predominant in 70% of incidents (Mahmud et al., 2021).

An estimated 1.8 million people in private households in the UK reported having self-reported persistent COVID (symptoms lasting longer than 4 weeks and after primary reported coronavirus COVID-19 infection) (2.8 % of the population) (UK - Office for National Statistics, 2022).

Among 3,171 adult COVID-19 patients who were not hospitalized, 69 percent visited man outpatient facility between 28 and 180 days after diagnosis. In two-thirds of the instances, a new primary diagnosis was made, and in one-third of the cases, a new specialist was consulted. A typical new visit diagnosis was symptoms that could have been brought on by COVID-19. Visits for these symptoms subsided after 60 days, but for some patients, they persisted for another 120–180 days (Hernandez-Romieu et al., 2021).

Participants who experienced persistent COVID symptoms included 382,000 (21%) who apparently had (or presumed they had) COVID-19 less than 12 weeks ago, 1.3 million (73%) who had it at least 12 weeks ago, 791,000 (44%) who had it at least a year ago, and 235,000 (13%) who had it at least 2 years ago (UK - Office for National Statistics, 2022).

According to estimates from the UK's Office for National Statistics, 22.1 percent of the country's general population experienced at least one lasting symptom five weeks after infecting SARS-CoV-2, and 9.8 percent experienced symptoms for at least 12 weeks (NCRC, 2022).

According to an Italian study, 87 % of persons who were recovered and after getting discharged from hospitals still had minimum one symptom after 60 days 55 percent of respondents had three or more symptoms, compared to 32 percent who reported one or two. These patients did not have a fever or any other signs of illness. Fatigue (53.1%), a decreased quality of life (44.1%), joint pain (27.3%), dyspnea (43.4%), and chest pain (21.7%) were the most commonly mentioned issues. Other symptoms included cough, rashes on the skin, palpitations, headaches, diarrhea, and a 'pins and needles' sensation. In addition to mental health difficulties such anxiety, posttraumatic stress disorder and depression, patients reported being unable to do regular everyday activities (Carfi et al., 2020).

Only 0.7% of participants in an online questionnaire-based research of 2113 post-COVID-19 patients reported being symptom-free 79 days after an acute COVID-19 infection. Fatigue (87%) and dyspnea (71%) were also identified as the most common symptoms at this time (Goërtz et al., 2020).

Another study found that even three months after being discharged from the hospital, COVID-19 patients still feel extreme fatigue and dyspnea (Arnold et al., 2020).

The most frequently reported clinical manifestations at 110 days after release from the hospital were fatigue (53 percent), dyspnea (43 percent), loss of memory (34 percent), sleep disorders (30.8percent), concentration impairment (28 percent), and joint pain (27 percent), according to a survey-based study involving post-discharged hospitalized patients (Garrigues et al., 2020).

The five most prevalent Long COVID-19 symptoms, as shown in a recent meta-analysis, were fatigue (58 percent), headache (44 percent), attention deficit (27 percent), hair loss (25 percent), and dyspnea (24 percent) (Lopez-Leon et al., 2021).

Of individuals who self-reported having prolonged COVID, fatigue had been the most often described symptom (51 percent), following shortness of breath (33 percent), loss of smell (26 percent), and concentration difficulties (23 percent) (UK - Office for National Statistics, 2022).

One study indicated that even more than 50percent of patients infected with SARS-CoV-2 felt fatigued after 10 weeks, which is a frequent symptom. There was no connection between the onset of fatigue, the severity of COVID-19, or the levels of inflammatory markers. In people who are fatigued, female sex and diagnoses of anxiety or depression are more frequent (Townsend et al., 2020).

Although the SARS-CoV-2 virus infects people of all ages, numerous cohorts have found that the hospitalization rate of COVID-19 rose with age, with such a rate of 4% for participants 50-59 years compared 18% for those above 80 years, and these persons are associated with a significantly greater risk for developing Long-COVID (Verity et al., 2020).

Preliminary research of participants with moderate sickness (non-hospitalized) found that a higher proportion (47%) of respondents over the age of 50 did not return to their typical health than 26 percent of subjects between the ages of 18 and 34 (Tenforde et al., 2020).

Another study, conducted by Sudre et al (2020), discovered that Long-COVID-19 prevalence increased from 10% of patients aged 18-49 years to 22% among those aged over 70 years, with a slightly higher percentage (15%) of Long-COVID in middle-aged females (50-60 years) in compared to male (10 percent); nevertheless, thus a gender-related variability is not detected in people older than 70 years.

The highest reported prevalence for self-reported long COVID as a percentage of the UK population was among those 35 to 49 years old, females, residents of less affluent areas, those who are social care worker, teaching and education, or health care, as well as those who had another activity-restricting health condition or disability (UK - Office for National Statistics, 2022).

Another study on people with Long-COVID-19 conducted in the UK found that Long-COVID-19 symptoms are associated to underlying co-morbidities such obesity and asthma across all age groups. In elderly individuals older than 70, the emergence of Long-COVID-19 has been associated to cardiopulmonary diseases. (Sudre et al., 2021).

According to the Centers for Disease Control and Prevention, 87 percent of COVID-19 hospitalized patients had persistent symptoms, compared to 35 percent of outpatient patients, and 35 percent of persons who tested positive for COVID failed to return to work 14 to 21 days later (Tenforde et al., 2020).

1.2 million Persons (67 % among those with self-reported long-term COVID) said that their ability to carry out daily tasks was "very limited," whereas 346,000 (19 percent) said the same (UK - Office for National Statistics, 2022).

According to Davis et al. (2021), long-term illness affected people's quality of life. They assessed that 45.2% of persons needed a less workload and 22.3% had not gone back to work following a 7-month acute illness.

40% of hospitalized patients who had long-term COVID-19 individuals with persistent symptoms reported having a poor quality of life and having limited functionality even 60 days after being discharged (Chopra et al., 2021). According to (Pan American Health Organization, 2022) Physical and rehabilitation medicine doctors, physiotherapists, respiratory therapists, speech and language therapists, occupational therapists, and psychologists are frontline health workers who should be involved in the care of patients who experience severe cases of COVID-19 and should be integrated into national COVID-19 emergency health planning.

KAP Evaluate the extent of a specific situation; confirm or refute a theory; reveal additional tangents of the actuality of a situation; Improve specific theme knowledge, attitude, and practices; identify what is known and done about numerous health-related subjects; Create a baseline (reference value) for future assessments and assist in measuring the effectiveness of health education programs in changing health-related behaviors Suggest an intervention strategy that takes into account specific local circumstances as well as the cultural variables that influence them; arrange activities that are appropriate for the population concerned. (The KAP Survey Model (Knowledge, Attitudes, and Practices), 2022) Existing a good knowledge of Health Professionals is necessary for developing a positive attitude that results in appropriate and effective practice (Asdaq et al., 2021).

3.1 Study Design

A cross-sectional study design was selected for this study with a self-structured questionnaire and interviews were conducted with Health Professionals. This study design was appropriate to find out the objectives. The data was collected within a short time frame.

3.2 Study Site

Data was collected from two selected hospitals. One of them was Center for the Rehabilitation of the Paralysed, Savar, Dhaka. Another was Enam Medical College & Hospital, Savar, Dhaka.

3.3 Study Population

Health Professionals including Physician, Nurse, Physiotherapist, Occupational Therapist, Speech & Language Therapist and Prosthetist & Orthotist who are providing health care services in the selected hospitals was chosen as a sample population to carry out this study.

3.4 Sampling Technique

For this study the snowball sampling technique was selected to reach maximum participants within a specific group of population. The sample was met the inclusion and exclusion criteria.

3.5 Inclusion Criteria

- Health Care Professional
- Evolve consent to participate
- Age above 18 years
- Male and female gender

3.6 Exclusion Criteria

- Unresponsive participants
- Declined to participate
- Incomplete response

3.7 Sample Size Calculation

The calculation of sample size was performed by using “EPI INFO” 7.4.2.0 software version which is developed by Center for Disease Control in the US. For the sample size calculation, the reference figure of 739 was used (The total number of Health Professionals employed in the hospitals which were selected for this study) with a cluster figure of two (The number of selected hospitals CRP & EMCH) then the calculation was made with 25% of expected frequency, 5% margin of error and 1.0 design effect. The sample size was generated as a minimum of 298 with a minimum of 149 samples per Hospital.

Population survey or descriptive study
For simple random sampling, leave design effect and clusters equal to 1.

Population size:	739		
Expected frequency:	25 %		
Acceptable Margin of Error:	5 %		
Design effect:	1.0		
Clusters:	2		

Confidence Level	Cluster Size	Total Sample
80%	53	106
90%	80	160
95%	104	208
97%	120	240
99%	149	298
99.9%	194	388
99.99%	224	448

3.8 Sample Size

So, initially, the researcher’s goal was to focus the study on 298 samples using the calculation above. We were able to reach out 306 sample conveniently and overcome our goal.

3.9 Data Collection Tools

Self-structured questionnaire consisting of five parts including socio demographic, COVID related experience, knowledge, attitude and practice was used to conduct this study.

3.10 Questionnaire:

A self-structured questionnaire was generated containing informed consent into the 1st page where the participants were informed about the purpose of the study along with their voluntary participation and assured that their information would be kept confidential and will not be harmful to them yet they can withdraw at any time without any negative consequences.

The 1st part of the questionnaire was designed to gather socio demographic information with 8 questions related to address, age, gender, marital status, profession, education, work position and clinical experience.

In the 2nd part COVID related experience was taken out with 9 questions as like; have you been diagnosed with COVID 19? Taken COVID 19 Vaccine? If yes, how many doses? Do you have any persistent symptoms?

The 3rd part was consisting of 10 score question related to knowledge about long COVID.

The 4th part of the questionnaire was consisting of 3 questions related to attitude toward activity problem, rehabilitation and cure of Long COVID.

The 5th part of the questionnaire was consisting of 4 questions related to practice for long COVID.

3.11 Data Collection

A self-structured questionnaire was designed to take face to face mutually convenient scheduled interview of the health professionals by ensuring that all the information required has been obtained while at the same time participants were given freedom to respond and illustrate concepts which took 10-15 minutes to complete. Before starting data, collection Eligibility criteria was properly screened and consent for data collection was taken. Confidentiality, ethics and safety was carefully maintained.

Prior to filling out the questionnaire, each participant provided their written consent. The researcher gave the participants an explanation of the study's purpose, goals, and methodology. Each participant signed a written consent form that was given by the researcher. As a result, the participant confirmed that they were able to understand the consent form and that their participation was voluntary. The confidentiality of the participants' data was made very obvious to them. The researchers provided the participants his assurance that they wouldn't suffer any negative effects from the study. It was clarified that the study's participants might not necessarily benefited from it. Participants were free to withdraw their consent and stop taking part at any time without experiencing any consequences. To maintain confidentiality, information from this study was coded anonymously, and no one's identity was revealed in any publication that included the study's findings.

3.12 Data Analysis

The data analysis was performed in SPSS version 20 and Microsoft Office Excel 2013 was used to decorate data. The variable was determined as nominal, ordinal, interval, ratio data & considered their parametric & non-parametric properties based on data type, normality test, and standard procedure (Table 01.3.13). The statistical test had been performed as descriptive and inferential statistics based on parametric or non-parametric properties (Table 02.3.14). The descriptive statistics were performed as frequency & percentage in nominal and ordinal data. Mean and standard deviation had been calculated for interval and ratio data. The inferential statistic had been performed as (Table 02.3.14). The one-way ANOVA test, Pearson correlation, Chi-Square and independent T test were all used to determine the relationship between the various variables (Table 06.4.4.1- Table 13.4.4.8). A binary logistic regression analysis was carried out in order to ascertain the association between categorical dependent variables and predictor variables (Table 14.4.5). The significance level was set at alpha value $P < .05$.

3.13 Determination of nature of data

The variable was determined as nominal, ordinal, interval, ratio data & considered their parametric & non-parametric properties based on data type, normality test, and standard procedure.

Table 01.3.13: Normality test for different variable

Variables	Description	Data type	Normality test	Data distribution
Address	CRP EMCH	Nominal		Non-parametric
Age		Ratio	P=(0.000),(0.000)	Parametric
Age in Category	20-30yrs 31-40yrs 41-50yrs 51-60yrs 61-70yrs	Ordinal		Non-parametric
Gender	Male Female	Nominal		Non-parametric
Marital status	Married Unmarried	Nominal		Non-parametric
Profession	Physician, Nurse, Physiotherapist, Occupational therapist, Speech and language therapist, others	Nominal		Non-parametric
Education	Diploma, Bachelor's degree, Post graduate/Master's degree	Ordinal		Non-parametric
Current work position	Tertiary care hospital, Rehabilitation centre	Nominal		Non-parametric
Clinical experience		Ratio	P=(0.000),(0.000)	Parametric
Clinical experience in category	1-5 yrs. 6-10 yrs. 11-15 yrs. 16-20 yrs. 21-25 yrs. 26-30 yrs. 36-40 yrs.	Ordinal		Non-parametric
Diagnosed with Covid	Yes No	Nominal		Non-parametric
Duration since covid positive		Ratio	P=(0.000),(0.000)	Parametric

Taken Covid 19 vaccine	Yes No	Nominal		Non-parametric
Number of vaccine doses		Ratio	P=(0.000),(0.000)	Parametric
Duration since 1 st dose		Ratio	P=(0.000),(0.000)	Parametric
Duration since 2 nd dose		Ratio	P=(0.000),(0.000)	Parametric
Duration since 3 rd dose		Ratio	P=(0.000),(0.000)	Parametric
Have any persistent symptoms	Yes No	Nominal		Non-parametric
Knowledge		Ratio	P=(0.000),(0.000)	Parametric
Knowledge in Category	Poor, Good, Excellent	Ordinal		Non-parametric
Attitude activity problem	Agree, Disagree, Undecided	Nominal		Non-parametric
Attitude Required Rehabilitation	Agree, Disagree, Undecided	Nominal		Non-parametric
Attitude Cure	Agree, Disagree, Undecided	Nominal		Non-parametric
Practice patient education	Yes, No, Sometimes	Nominal		Non-parametric
Practice Heart rate monitoring	Yes, No, Sometimes	Nominal		Non-parametric
Practice Stop rest pace approach	Yes, No, Sometimes	Nominal		Non-parametric
Practice Check Post Exertional Symptoms	Yes, No, Sometimes	Nominal		Non-parametric

3.14 Determination of statistical test

The statistical test had been performed as descriptive and inferential statistics based on parametric or non-parametric properties. The descriptive statistics were performed as frequency & percentage in nominal and ordinal data. Mean and standard deviation had been calculated for interval and ratio data. The inferential statistic had been performed as follow:

Table 02.3.14: Inferential Statistical Test

Purpose	Variable	Statistical test
Relationship	Two (2) categorical data (non-parametric)	Chi square test
	One categorical (non-parametric) and one parametric data	Independent t-test (independent bi-variant data)
		One way ANOVA (independent Tri-variant)
		Chi-square test (independent multi-variant data)
	Two (2) parametric data	Pearson correlation
Regression of relationship	Dependent Bivariate as categorical data (Bivariate)	Binary logistic regression

3.15 Ethical Consideration

The proposal was submitted to the Institutional Review Board (IRB) of the Bangladesh Health Profession Institute (BHPI) and after the defense, the research proposal approval was taken from the IRB. Permission was taken from the Head of the Physiotherapy department of BHPI, Head of Program of CRP, Head of the Department of Physiotherapy CRP, Head of the Department of Occupational therapy of CRP, Head of the Department of Speech & Language Therapy of CRP, In charge of pediatric Unit CRP and CEO of Enam Medical College Hospital before data collection. Written consent was taken from each participant before collecting the data. The principles of the Helsinki Declaration were followed throughout the research to ensure confidentiality, ethics and privacy.

In this study the results which were found have been showed in different tables.

4.1 Socio-demographic part: This table contains different variables such as Address, Age, Age in category, Gender, Marital Status, Profession, Education, Current work position, Clinical Experiences, Clinical experience in category. These are described frequency, percentage, mean and standard deviation.

Table 03.4.1: Socio-demographic chart with frequency, percentage, mean & SD

Variables	Mean \pm SD, Frequency (%)	
Address	CRP	134 (43.8%)
	EMCH	172 (56.2%)
Age	29.60 \pm 7.355 years	
Age in category	20-30 yrs.	217 (70.9%)
	31-40 yrs.	64 (20.9%)
	41-50 yrs.	19 (6.2%)
	51-60 yrs.	3 (1%)
	61-70 yrs.	3 (1%)
Gender	Male	106 (34.6%)
	Female	200 (65.4%)
Marital Status	Married	196 (64.1%)
	Unmarried	110 (35.9%)
Profession	Physician	71 (23.2%)
	Nurse	112 (36.6%)
	Physiotherapist	73 (23.9%)
	Occupational Therapist	27 (8.8%)
	Speech & Language Therapist	14 (4.6%)
	Others	9 (2.9%)
Education	Diploma	106 (34.6%)
	Bachelor's Degree	131 (42.8%)
	Postgraduate/ Master's Degree	69 (22.5%)
Current work position	Tertiary Care Hospital	182 (59.5%)
	Rehabilitation Center	124 (40.5%)
Clinical Experiences	5.79 \pm 5.927 years	
Clinical experience in category	1-5 yrs.	205 (66.7%)
	6-10 yrs.	50 (16.3%)
	11-15 yrs.	27 (8.8%)
	16-20 yrs.	14 (4.6%)
	21-25 yrs.	9 (2.9%)
	26-30 yrs.	1 (.3%)
	36-40 yrs.	1 (.3%)

4.1.1 Address of the Participants

Out of 306 participants (n=134) 43.8% was from CRP and (n=172) 56.2% was from EMCH.

4.1.2 Over all age of the Participants

The participant's age was 29.60 ± 7.355 years (Mean & SD).

4.1.3 Age in Category

Among 306 participants (n=217) 70.9% people's age group was 20-30 years. (n=64) 20.9% people's age group was 31-40 years. (n=19) 6.2% people's age group was 41-50 years. (n=3) 1% people's age group was 51-60 years. (N=3) 1% people's age group was 61-70 years.

4.1.4 Gender

Among total participants (n=106) 34.6% was Male and (n=200) 65.4% was Female.

4.1.5 Marital Status

Among total participants (n=196) 64.1% was Married and (n=110) 35.9% was Unmarried.

4.1.6 Profession

Among total participants Physician was (n=71) 23.2%, Nurse was (n=112) 36.6%, Physiotherapist was (n=73) 23.9%, Occupational Therapist was (n=27) 8.8%, Speech & Language Therapist was (n=14) 4.6% and (n=9) 2.9% was others Health Professionals.

4.1.7 Education

Educational status for total participants was Diploma (n=106) 34.6%, Bachelor's Degree (n=131) 42.8% and Postgraduate/ Master's Degree (n=69) 22.5%.

4.1.8 Current work position

(n=182) 59.5% Health professional's work position was in a Tertiary Care Hospital and (n=124) 40.5% Health professional's work position was in a Rehabilitation Center.

4.1.9 Over all clinical experiences

The participant's clinical experience was 5.79 ± 5.927 years (Mean & SD).

4.1.10 Clinical experience in category

Among total participants (n=205) 66.7% Health Professional's clinical experience was in between 1-5 years, (n=50) 16.3% was in between 6-10 years, (n=27) 8.8% was in between 11-15 years, (n=14) 4.6% was in between 16-20 years, (n=9) 2.9% was in between 21-25 years, (n=1) 0.3% was in between 26-30 years and (n=1) 0.3% was in between 36-40 years of clinical experience.

4.2 COVID related experience

This table demonstrate different variables related to COVID related experience of the participants which are described in frequency, percentage, mean and standard deviation.

Table 04.4.2: COVID related experience with frequency, percentage, mean & SD

Variables		Mean \pm SD, Frequency (%)
Diagnosed with COVID	Yes	53 (17.3%)
	No	253 (82.7%)
Duration since COVID positive		54.82 \pm 156.141
Treatment Received	Home management	50 (16.3%)
	Hospital management	3 (1%)
	N/A	253 (82.7%)
Taken COVID19 vaccine	Yes	280 (91.5%)
	No	26 (8.5%)
Number of vaccine doses	0	27 (8.8%)
	1	14 (4.6%)
	2	144 (47.1%)
	3	121 (39.5%)
Duration since 1 st dose		312.14 \pm 158.692
Duration since 2nd dose		253.62 \pm 150.142
Duration since 3 rd dose		40.97 \pm 58.913
Have any persistent symptoms	Yes	27 (8.8%)
	No	279 (91.2%)
Fever	Yes	8 (2.6%)
	No	298 (97.4%)
Breathlessness	Yes	2 (.7%)
	No	304 (99.3%)
Runny nose	Yes	2 (.7%)
	No	304 (99.3%)
Muscle pain	Yes	2 (.7%)
	No	304 (99.3%)
Headache	Yes	5 (1.6%)
	No	301 (98.4%)
Dysphonia	Yes	1 (.3%)
	No	305 (99.7%)
Fatigue	Yes	12 (3.9%)
	No	294 (96.1%)
Cough	Yes	5 (1.6%)
	No	301 (98.4%)
Memory loss	Yes	1 (.3%)
	No	305 (99.7%)
Dizziness	Yes	2 (.7%)
	No	304 (99.3%)
Nausea	Yes	1 (.3%)
	No	305 (99.7%)
Sore Throat	Yes	1 (.3%)
	No	305 (99.7%)

Weakness	Yes	5 (1.6%)
	No	301 (98.4%)
Decrease smell and test	Yes	1 (.3%)
	No	305 (99.7%)

4.2.1 Diagnosed with COVID

Within the (n=306) total participants (n=53)17.3% was diagnosed with COVID Positive.

4.2.2 Duration since COVID positive

Duration since COVID positive was 54.82±156.141 days (mean & SD).

4.2.3 Treatment received

Among the participants (n=50) 16.3% received home management and (n=3) 1% received Hospital management.

4.2.4 Taken COVID19 vaccine

Out of total participants (n=280) 91.5% participants taken COVID 19 vaccine while (n=26) 8.5% participants didn't take any vaccine.

4.2.5 Number of vaccine doses

(n=14) 4.6% participant's received number of vaccine doses was 1, (n=144) 47.1% participant's received number of vaccine doses was 2 and n= (121) 39.5% participant's received number of vaccine doses was 3.

4.2.6 Duration of vaccine

The participant's Duration since 1st dose was 312.14±158.692 (mean & SD), Duration since 2nd dose was 253.62±150.142 (mean & SD) and Duration since 3rd dose was 40.97±58.913 (mean & SD).

4.2.7 Persistent symptoms with complication

(n=27) 8.8% Participants squealed persistent symptoms. Symptoms are fever (n=8) 2.6%, Breathlessness (n=2) 0.7%, Runny nose (n=2) 0.7% Muscle pain (n=2). 7% Headache (n=5) 1.6%, Dysphonia (n=1) 0.3%, Fatigue (n=12) 3.9%, Cough (n=5) 1.6%, Memory loss (n=1) 0.3%, Dizziness (n=2) 0.7%, Nausea (n=1) 0.3%, Sore Throat (n=1) 0.3%, Weakness (n=5) 1.6%, Decrease smell and test (n=1) .3%.

4.3 Knowledge, Attitude & Practice

This table demonstrate different variables related to Knowledge, Attitude and Practice of the participants which are described in frequency, percentage, mean and standard deviation.

Table 5.4.3: Knowledge, Attitude & Practice with frequency, percentage, mean & SD

Variables		Mean ± SD, Frequency (%)
Knowledge		6.17±1.872
Knowledge in Category	Poor	22 (7.2%)
	Good	148 (48.4%)
	Excellent	136 (44.4%)
Attitude Activity Problem	Agree	228 (74.5%)
	Disagree	39 (12.7%)
	Undecided	39 (12.7%)
Attitude Required Rehabilitation	Agree	266 (86.9%)
	Disagree	6 (2%)
	Undecided	34 (11.1%)
Attitude Cure	Agree	231 (75.5%)
	Disagree	15 (4.9%)
	Undecided	60 (19.6%)
Practice Patient Education	Yes	219 (71.6%)
	No	12 (3.9%)
	Sometimes	75 (24.5%)
Practice Heart rate monitoring	Yes	186 (60.8%)
	No	26 (8.5%)
	Sometimes	94 (30.7%)
Practice Stop rest pace approach	Yes	153 (50%)
	No	49 (16%)
	Sometimes	104 (34%)
Practice Check Post Exertion Symptoms	Yes	220 (71.9%)
	No	20 (6.5%)
	Sometimes	66 (21.6%)

4.3.1 knowledge

In the participant's knowledge score, the mean was 6.17 out of 10, and the standard deviation was 1.872.

4.3.2 Knowledge in category

Knowledge regarding Long COVID was poor among (n=22) 7.2% health professionals, Good among (n=148) 48.4% health professionals and Excellent among (n=136) 44.4% health professionals.

4.3.3 Attitude activity problem

(n=266) 86.9% health professionals agreed that people with Long COVID symptoms experiences problems in self-care, mobility issues and return to work; (n=39) 12.7% health professionals disagreed and (n=39) 12.7% participant's decision was undecided.

4.3.4 Attitude required rehabilitation

(n=266) 86.9% Health professionals agreed that rehabilitation is required for Long COVID symptoms; (n=6) 2% participants disagreed and (n=34) 11.1% participant's decision was undecided.

4.3.5 Attitude Cure

(n=231) 75.5% Health professionals agreed that Long COVID symptoms can be cured; (n=15) 4.9% participants disagreed and (n=60) 19.6% participant's decision was undecided.

4.3.6 Practice Patient Education

As a result of educating people with Long COVID about resuming everyday activities conservatively at an appropriate pace within the limit of current symptoms (n=219) 71.6% participants responded with "Yes"; (n=12) 3.9% participants responded with "No" and (n=75) 24.5% participants responded with "Sometimes".

4.3.7 Practice Heart rate monitoring

On account of suggest to monitor heart rate for managing fatigue and post exertion malaise (n=186) 60.8% participants responded with "Yes", (n=26) 8.5% participants responded with "No" and (n=94) 30.7% participants responded with "sometimes".

4.3.8 Practice Stop rest pace approach

In respect of applying "stop-rest-pace" approach to avoid exacerbation of symptoms (n=153) 50% participants responded with "Yes", (n=49) 16% participants responded with "No" and (n=104) 34% participants responded with "Sometimes"

4.3.9 Practice Check Post Exertion Symptoms

In regard to check post exertion symptoms during physical activity (n=220) 71.9% participants responded with "Yes", (n=20) 6.5% participants responded with "No" and (n=66) 21.6% participants responded with "Sometimes".

4.4 Relationship

4.4.1 Relationship with Knowledge

This table demonstrate relationship between Knowledge score (Dependent) and socio demographic (independent) variables (address, age, gender, marital status, etc.....) and contained the test value and p values.

Table 06.4.4.1: Association between dependent (Knowledge score) variable with the independent variable (socio demographics)

Socio demographic Variable	Test	Test Value	P Value
Address	Independent T test	3.338	.001*
Age	Pearson Correlation	.222	.0001*
Age in Category	Chi-square	50.687	.120
Gender	Independent T test	-3.461	.001*
Marital Status	Independent T test	-0.274	.785
Profession	Chi-square	107.261	.0001*
Education	Chi-square	71.309	.0001*
Work Position	Chi-square	18.554	.046*
Clinical Experience	Pearson Correlation	.091	.114
Clinical experience in Category	Chi-square	53.913	.696

Alpha value: *= $<.05$, **= $<.01$, ***= $<.001$

The observed address independent T-test value was 3.338 and the level of significance was 5%. The overall p-value for address was ($p>0.001$) As a result, the result was significant, indicating that there was an association between address and knowledge.

The observed age overall Pearson Correlation test value was 0.222 and the level of significance was 5%. The overall p-value for age was ($p>0.0001$). As a result, the result was significant, indicating that there was an association between age overall and Knowledge.

The observed age in category Chi-square test value was 50.687 and the level of significance was 5%. The Overall p value for age in category was ($p<0.120$). As a result, the result was not significant, indicating that there was no strong association between ages in category with Knowledge.

The gender Independent T- test value was -3.461, with a 5% level of significance. The gender p-value was ($p>0.001$). As a result, the outcome was significant, indicating that there was association between gender and knowledge.

The Independent T-test value for observed marital status was -0.274, with a significance level of 5%. ($p<0.785$) is the p-value for married status. As a result, the result was not

statistically significant, indicating that there was no strong association between marital status and Knowledge score.

The Chi-square test value for observation of profession was 107.261, with a significance level of 5%. For profession the p-value was ($p > 0.0001$) indicating that, the result was significant. As a result, there was a strong association between profession and knowledge score.

The Chi-square test value for observation of Education was 71.309, with a significance level of 5%. For Education the p value was ($p > 0.0001$) indicating that, the result was significant. As a result, there was a strong association between Education and knowledge score.

The observed Chi-square test value for work position was 18.554. With a significance level of 5%. For work position the p-value was ($p > 0.046$) indicating that, the result was significant. As a result, there was association between work position and knowledge score.

The observed Pearson Correlation test value for clinical experience was .091 with a significance level of 5%. ($p < 0.114$) was the p-value for clinical experience which indicates that, the result was not statistically significant. As a result, there was no association between clinical experience and knowledge score.

The observed Pearson Correlation test value for clinical experience in category was 53.913 with a significance level of 5%. ($p < 0.696$) was the p-value for clinical experience in category which indicates that, the result was not statistically significant. As a result, there was no association between clinical experience in category and knowledge score.

4.4.2 Relationship with Attitude (Self-care and mobility issues)

This table demonstrate relationship between Attitude in self- care and mobility issues (Dependent) for long COVID among health professionals and socio demographic (independent) variables (address, age, gender, marital status, etc.....) and contained the test value and p values.

Table 07.4.4.2: Association between dependent (Attitude in self- care and mobility issue) variable with the independent variable. (Socio demographics)

Socio demographic variable	Test	Test Value	P Value
Address	Chi-square	11.164	.004*
Age	One Way ANOVA	1.085	.350
Age in Category	Chi-square	3.302	.914
Gender	Chi-square	4.944	.084*
Marital Status	Chi-square	2.399	.301
Profession	Chi-square	17.178	.071*
Education	Chi-square	1.651	.800
Work Position	Chi-square	10.470	.005*
Clinical Experience	One Way ANOVA	1.254	.192
Clinical Experience in Category	Chi Square	17.960	.117

The observed address Chi-square test value was 11.164 and the level of significance was 5%. The overall p-value for address was ($p > 0.004$) As a result, the result was significant, indicating that there was an association between address and Attitude (Self-care and mobility issues).

The observed age overall One Way ANOVA test value was 1.085 and the level of significance was 5%. The overall p-value for age was ($p < 0.350$). As a result, the result was not statistically significant, indicating that there was no association between age overall and Attitude (Self-care and mobility issues).

The observed age in category Chi-square test value was 3.302 and the level of significance was 5%. The Overall p value for age in category was ($p < 0.914$). As a result, the result was not significant, indicating that there was no strong association between ages in category with Attitude (Self-care and mobility issues).

The gender Chi-square test value was 4.944, with a 5% level of significance. The gender p-value was ($p > 0.084$). As a result, the outcome was significant, indicating that there was association between gender and Attitude (Self-care and mobility issues).

The Chi-square test value for observed marital status was 2.399, with a significance level of 5%. ($p < 0.785$) is the p-value for married status. As a result, the result was not

statistically significant, indicating that there was no strong association between marital status and Attitude (Self-care and mobility issues).

The Chi-square test value for observation of profession was 17.178, with a significance level of 5%. For profession the p-value was ($p > 0.071$) indicating that, the result was significant. As a result, there was a strong association between profession and Attitude (Self-care and mobility issues).

The Chi-square test value for observation of Education was 1.651, with a significance level of 5%. For Education the p value was ($p < 0.800$) indicating that, the result was not significant. As a result, there was no association between Education and Attitude (Self-care and mobility issues).

The observed Chi-square test value for work position was 10.470. With a significance level of 5%. For work position the p-value was ($p > 0.005$) indicating that, the result was significant. As a result, there was association between work position and Attitude (Self-care and mobility issues).

The observed One-Way ANOVA test value for clinical experience was 1.254 with a significance level of 5%. ($p < 0.192$) was the p-value for clinical experience which indicates that, the result was not statistically significant. As a result, there was no association between clinical experience and Attitude (Self-care and mobility issues).

The observed Chi-square test value for clinical experience in category was 17.960 with a significance level of 5%. ($p < 0.117$) was the p-value for clinical experience in category which indicates that, the result was not statistically significant. As a result, there was no association between clinical experience in category and Attitude (Self-care and mobility issues).

4.4.3 Relationship with Attitude (Long COVID Rehabilitation)

This table demonstrate relationship between Attitude in Long COVID rehabilitation (Dependent) among health professionals and socio demographic (independent) variables (address, age, gender, marital status, etc.....) and contained the test value and p values.

Table 08.4.4.3: Association between dependent (Attitude in Long COVID rehabilitation) variable with the independent variable. (Socio demographics)

Socio demographic variable	Test	Test Value	P Value
Address	Chi-square	19.549	.0001*
Age	One Way ANOVA	.593	.966
Age in Category	Chi-square	2.798	.946
Gender	Chi-square	5.973	.050*
Marital Status	Chi-square	.708	.702
Profession	Chi-square	25.502	.004*
Education	Chi-square	12.995	.011*
Work Position	Chi-square	16.264	.0001*
Clinical Experience	One Way ANOVA	.805	.735
Clinical Experience in Category	Chi Square	3.241	.994

The observed address Chi-square test value was 19.549 and the level of significance was 5%. The overall p-value for address was ($p > 0.001$) As a result, the result was significant, indicating that there was an association between address and Attitude (Long COVID rehabilitation).

The observed age overall One Way ANOVA test value was 0.593 and the level of significance was 5%. The overall p-value for age was ($p < 0.966$). As a result, the result was not statistically significant, indicating that there was no association between age overall and Attitude (Long COVID rehabilitation)

The observed age in category Chi-square test value was 2.798 and the level of significance was 5%. The Overall p value for age in category was ($p < 0.946$). As a result, the result was not significant, indicating that there was no strong association between ages in category with Attitude (Long COVID rehabilitation).

The gender Chi-square test value was 5.973, with a 5% level of significance. The gender p-value was ($p > 0.050$). As a result, the outcome was significant, indicating that there was association between gender and Attitude (Long COVID rehabilitation).

The Chi-square test value for observed marital status was 0.708, with a significance level of 5%. ($p < 0.702$) is the p-value for married status. As a result, the result was not

statistically significant, indicating that there was no strong association between marital status and Attitude (Long COVID rehabilitation).

The Chi-square test value for observation of profession was 25.502, with a significance level of 5%. For profession the p-value was ($p > 0.004$) indicating that, the result was significant. As a result, there was a strong association between profession and Attitude (Long COVID rehabilitation).

The Chi-square test value for observation of Education was 12.995, with a significance level of 5%. For Education the p value was ($p > 0.011$) indicating that, the result was significant. As a result, there was association between Education and Attitude (Long COVID rehabilitation).

The observed Chi-square test value for work position was 16.264. With a significance level of 5%. For work position the p-value was ($p > 0.0001$) indicating that, the result was significant. As a result, there was association between work position and Attitude (Long COVID rehabilitation).

The observed One-Way ANOVA test value for clinical experience was 0.805 with a significance level of 5%. ($p < 0.735$) was the p-value for clinical experience which indicates that, the result was not statistically significant. As a result, there was no association between clinical experience and Attitude (Long COVID rehabilitation).

The observed Chi-square test value for clinical experience in category was 3.241 with a significance level of 5%. ($p < 0.994$) was the p-value for clinical experience in category which indicates that, the result was not statistically significant. As a result, there was no association between clinical experience in category and Attitude (Long COVID rehabilitation).

4.4.4 Relationship with Attitude (Cure of Long COVID Symptoms):

This table demonstrate relationship between Attitude for Cure of Long COVID Symptoms (Dependent) among health professionals and socio demographic (independent) variables (address, age, gender, marital status, etc.....) and contained the test value and p values.

Table 09.4.4.4: Association between dependent (Attitude for Cure of Long COVID Symptoms) variable with the independent variable (Socio demographics)

Socio demographic variable	Test	Test Value	P Value
Address	Chi-square	3.577	.167
Age	One Way ANOVA	.693	.901
Age in Category	Chi-square	5.815	.668
Gender	Chi-square	3.158	.206
Marital Status	Chi-square	.792	.673
Profession	Chi-square	.792	.698
Education	Chi-square	6.683	.154
Work Position	Chi-square	4.060	.131
Clinical Experience	One Way ANOVA	1.305	.155
Clinical Experience in Category	Chi Square	11.419	.493

Association between Attitude for Cure of Long COVID Symptoms (dependent) and Socio demographics (Independent) was observed by Chi-square test (two non-parametric data) and One Way ANOVA test (one parametric data and one non-parametric data). For all of the independent variable the p value was ($p < \text{independent variable}$) and the level of significance was 5%. As a result, the result was not significant, indicating that there was no association between Socio demographics and Attitude for Cure of Long COVID Symptoms.

4.4.5 Relationship with Practice (Patient Education)

This table demonstrate relationship between Practice (Patient Education) for Long COVID Symptoms (Dependent) among health professionals and socio demographic (independent) variables (address, age, gender, marital status, etc.....) and contained the test value and p values.

Table 10.4.4.5: Association between dependent (Practice regarding patient education) variable with the independent variable (Socio demographics)

Socio demographic variable	Test	Test Value	P Value
Address	Chi-square	.707	.702
Age	One Way ANOVA	.703	.892
Age in Category	Chi-square	3.768	.877
Gender	Chi-square	1.361	.506
Marital Status	Chi-square	2.830	.243
Profession	Chi-square	8.838	.548
Education	Chi-square	3.100	.541
Work Position	Chi-square	.556	.757
Clinical Experience	One Way ANOVA	.890	.620
Clinical Experience in Category	Chi Square	4.241	.979

Association between Practice regarding patient education (dependent) and Socio demographics (Independent) was observed by Chi-square test (two non- parametric data) and One Way ANOVA test (one parametric data and one non-parametric data). For all of the independent variable the p value was ($p < \text{independent variable}$) and the level of significance was 5%. As a result, the result was not significant, indicating that there was no association between Socio demographics and Practice regarding patient education.

4.4.6 Relationship with Practice (Monitoring heart rate)

This table demonstrate relationship between Practice (Monitoring heart rate) for Long COVID Symptoms (Dependent) among health professionals and socio demographic (independent) variables (address, age, gender, marital status, etc.....) and contained the test value and p values.

Table 11.4.4.6: Association between dependent (Practice regarding Monitoring Heart rate) variable with the independent variable (Socio demographics)

Socio demographic variable	Test	Test Value	P Value
Address	Chi-square	22.922	.0001*
Age	One Way ANOVA	1.095	.336
Age in Category	Chi-square	9.231	.323
Gender	Chi-square	5.144	.076*
Marital Status	Chi-square	3.170	.205
Profession	Chi-square	30.559	.001*
Education	Chi-square	9.186	.057*
Work Position	Chi-square	25.718	.0001*
Clinical Experience	One Way ANOVA	1.386	.108
Clinical Experience in Category	Chi Square	14.131	.292

The observed address Chi-square test value was 22.922 and the level of significance was 5%. The overall p-value for address was ($p > 0.0001$) As a result, the result was significant, indicating that there was an association between address and Practice (Monitoring Heart rate).

The observed age overall One Way ANOVA test value was 1.095 and the level of significance was 5%. The overall p-value for age was ($p < 0.336$). As a result, the result was not statistically significant, indicating that there was no association between age overall and Practice (Monitoring Heart rate).

The observed age in category Chi-square test value was 9.231 and the level of significance was 5%. The Overall p value for age in category was ($p < 0.323$). As a result, the result was not significant, indicating that there was no strong association between ages in category with Practice (Monitoring Heart rate).

The gender Chi-square test value was 5.144, with a 5% level of significance. The gender p-value was ($p > 0.076$). As a result, the outcome was significant, indicating that there was association between gender and Practice (Monitoring Heart rate).

The Chi-square test value for observed marital status was 3.170, with a significance level of 5%. ($p < 0.205$) is the p-value for married status. As a result, the result was not

statistically significant, indicating that there was no strong association between marital status and Practice (Monitoring Heart rate).

The Chi-square test value for observation of profession was 30.559, with a significance level of 5%. For profession the p-value was ($p > 0.001$) indicating that, the result was significant. As a result, there was a strong association between profession and Practice (Monitoring Heart rate).

The Chi-square test value for observation of Education was 9.186, with a significance level of 5%. For Education the p value was ($p > 0.057$) indicating that, the result was significant. As a result, there was association between Education and Practice (Monitoring Heart rate).

The observed Chi-square test value for work position was 25.718. With a significance level of 5%. For work position the p-value was ($p > 0.0001$) indicating that, the result was significant. As a result, there was association between work position and Practice (Monitoring Heart rate).

The observed One-Way ANOVA test value for clinical experience was 1.386 with a significance level of 5%. ($p < 0.108$) was the p-value for clinical experience which indicates that, the result was not statistically significant. As a result, there was no association between clinical experience and Practice (Monitoring Heart rate).

The observed Chi-square test value for clinical experience in category was 14.131 with a significance level of 5%. ($p < 0.292$) was the p-value for clinical experience in category which indicates that, the result was not statistically significant. As a result, there was no association between clinical experience in category and Practice (Monitoring Heart rate).

4.4.7 Relationship with Practice (Stop-rest-pace Approach)

This table demonstrate relationship between Practice (Stop-rest-pace Approach) for Long COVID Symptoms (Dependent) among health professionals and socio demographic (independent) variables (address, age, gender, marital status, etc.....) and contained the test value and p values.

Table 12.4.4.7: Association between dependent (Practice Stop-rest-pace Approach) variable with the independent variable (Socio demographics)

Socio demographic variable	Test	Test Value	P Value
Address	Chi-square	21.361	.0001*
Age	One Way ANOVA	.812	.764
Age in Category	Chi-square	6.325	.611
Gender	Chi-square	6.702	.035*
Marital Status	Chi-square	.966	.617
Profession	Chi-square	34.972	.0001*
Education	Chi-square	8.500	.075*
Work Position	Chi-square	20.736	.0001*
Clinical Experience	One Way ANOVA	1.475	.071*
Clinical Experience in Category	Chi Square	7.256	.840

The observed address Chi-square test value was 21.361 and the level of significance was 5%. The overall p-value for address was ($p > 0.0001$) As a result, the result was significant, indicating that there was an association between address and Practice Stop-rest-pace Approach.

The observed age overall One Way ANOVA test value was 0.812 and the level of significance was 5%. The overall p-value for age was ($p < 0.764$). As a result, the result was not statistically significant, indicating that there was no association between age overall and Practice Stop-rest-pace Approach.

The observed age in category Chi-square test value was 6.325 and the level of significance was 5%. The Overall p value for age in category was ($p < 0.611$). As a result, the result was not significant, indicating that there was no strong association between ages in category with Practice Stop-rest-pace Approach.

The gender Chi-square test value was 6.702, with a 5% level of significance. The gender p-value was ($p > 0.035$). As a result, the outcome was significant, indicating that there was association between gender and Practice Stop-rest-pace Approach.

The Chi-square test value for observed marital status was 0.966, with a significance level of 5%. ($p < 0.617$) is the p-value for married status. As a result, the result was not statistically significant, indicating that there was no strong association between marital status and Practice Stop-rest-pace Approach.

The Chi-square test value for observation of profession was 34.972, with a significance level of 5%. For profession the p-value was ($p > 0.0001$) indicating that, the result was significant. As a result, there was a strong association between profession and Practice Stop-rest-pace Approach.

The Chi-square test value for observation of Education was 8.500, with a significance level of 5%. For Education the p value was ($p > 0.075$) indicating that, the result was significant. As a result, there was association between Education and Practice Stop-rest-pace Approach.

The observed Chi-square test value for work position was 20.736 with a significance level of 5%. For work position the p-value was ($p > 0.0001$) indicating that, the result was significant. As a result, there was association between work position and Practice Stop-rest-pace Approach.

The observed One-Way ANOVA test value for clinical experience was 1.475 with a significance level of 5%. ($p > 0.071$) was the p-value for clinical experience which indicates that, the result was statistically significant. As a result, there was association between clinical experience and Practice Stop-rest-pace Approach.

The observed Chi-square test value for clinical experience in category was 7.256 with a significance level of 5%. ($p < 0.840$) was the p-value for clinical experience in category which indicates that, the result was not statistically significant. As a result, there was no association between clinical experience in category and Practice Stop-rest-pace Approach.

4.4.8 Relationship with Practice (Check Post exertion Symptoms)

This table demonstrate relationship between Practice (Check post exertion symptoms) and socio demographic variables (address, age, gender, marital status, etc.....) and contained the test value and p values.

Table 13.4.4.8: Association between dependent (Practice regarding check post exertion symptoms) variable with the independent variable (Socio demographics)

Socio demographic variable	Test	Test Value	P Value
Address	Chi-square	16.819	.0001*
Age	One Way ANOVA	1.022	.440
Age in Category	Chi-square	10.663	.222
Gender	Chi-square	3.416	.181
Marital Status	Chi-square	3.389	.184
Profession	Chi-square	24.690	.006*
Education	Chi-square	10.381	.034*
Work Position	Chi-square	18.967	.0001*
Clinical Experience	One Way ANOVA	1.110	.330
Clinical Experience in Category	Chi Square	3.750	.988

Within the observed independent variables, Test values shows Significance for Address, Profession, Education and Work Position which shows evidence that, there was association with Practice (Check post exertion symptoms).

And the other independent variables didn't showed significance in their test values which indicates there was no association with Practice (Check post exertion symptoms).

4.5 Regression

Regression of data was done to evaluate the association between predictor variables with other variables.

Table 14.4.5: Binary regression of knowledge parameter with other predictor variables

Predictor variables	Dependent variables: Knowledge Parameter			
	Nagelkerke R ²	B	P-value	OR
Attitude Activity Problem	0.122	1.794	0.0001*	6.016
Attitude Required Rehabilitation	0.265	2.854	0.0001*	17.365
Attitude Cure	0.103	1.643	0.0001*	5.172
Practice Check Post Exertion Symptoms	0.104	1.640	0.001*	5.153
Practice Stop rest pace approach	0.059	1.308	0.012*	3.700
Practice Heart rate monitoring	0.065	1.296	0.006*	3.653
Practice Patient Education	0.057	1.207	0.007*	3.215
Education	0.052	0.822	0.017*	2.276
Age	0.237	2.558	0.0001*	0.909
Gender	0.001	-0.137	0.773	0.872

Alpha value: *= $<.05$, **= $<.01$, *= $<.001$**

Knowledge is strongly associated ($P=<.05$) and has linier association with Age, Education, Attitude and Practice.

A reverse relation has been found and was not significant ($P=>.05$) with gender.

5.1 Discussion

This study goes about to evaluate Knowledge, Attitude and Practice regarding Long COVID among Health Professionals by a cross sectional study. The objectives of this study were 1) To demonstrate a socio demographic chart of the participants. 2) To collect COVID related information of the participants. 3) To determine knowledge in relation to long COVID among health professionals. 4) To explore attitude towards treatment and prevention for long COVID in health professionals. 5) To ascertain practice in relation to long COVID of health professionals. 6) To find out relationship of knowledge with socio demographic variables among health professionals. 7) To evaluate relation of socio demographic variables with Attitude toward long COVID among health professionals. 8) To see relation of socio demographic variables with practice regarding long COVID among health professionals. 9) To see association between categorical dependent variables and predictor variables.

Our study reached out all these objectives in the desired time frame. This is the very first study all over the world to include objective to evaluate the knowledge attitude and practice regarding long COVID among health professionals.

In this study among the total participants 8.8% had persistent symptoms but the number of people facing persistent symptoms is approximately 43% According to a WHO estimate of 470 million people globally (Chen et al., 2022). This could be due to differences in gender, geography, COVID-19 study population, follow-up time and many other factors.

We found in this study common Symptoms for Long COVID are fever 2.6%, Breathlessness 0.7%, Runny nose 0.7% Muscle pain .7% Headache 1.6%, Dysphonia 0.3%, Fatigue 3.9%, Cough 1.6%, Memory loss 0.3%, Dizziness 0.7%, Nausea 0.3%, Sore Throat 0.3%, Weakness 1.6%, Decrease smell and test .3% .Other study reported many common symptoms nearly similar to our study as fatigue (12.0%), change in sense of smell or taste (1.7%), shortness of breath (5.2%), cough (4.9%), headache (9.9%), and persistence of at least one initially occurring symptom (69.6%) (Wanga et al., 2021). Another study has reported a wide range of symptoms within those the most prevalent symptoms were fatigue 47%, dyspnoea 32%, myalgia 25%, and joint pain 20% headache 18%, cough 18%, chest pain 15%, altered smell14%, altered taste 7%,

diarrhoea 6%. The verities of symptoms may depend which system has affected as it affects multiple systems and the percentage of symptoms may depend on the number of populations selected in the study.

In our study we found the most common symptoms was fatigue which is similar to other studies (Aiyegbusi et al., 2021). (Wanga et al., 2021) another study describes the most prevalent symptoms were chest pain (up to 89%) rather than fatigue (up to 65%) (Cabrera et al., 2021). There are many other wide extents of symptoms has reported for Long COVID within them these are found very common symptoms.

In this study mean knowledge score of health professionals was 6.17 out of 10, and the standard deviation was 1.872, Knowledge regarding Long COVID was poor among 7.2% health professionals, Good among 48.4% health professionals and Excellent among 44.4% health professionals. Another study reported excellent knowledge of the participants about COVID-19 (Ferdous et al., 2020). However, there was many differences in sample, population and socio demographics from our study.

The result of our study found that health professional's Knowledge depends on age, gender, profession, education and work position which was statistically significant while other study has found dependent factor of knowledge on age and residing area (Ferdous et al., 2020).

In our study we found health professionals holds very positive attitude towards the Long COVID symptoms. 86.9% health professionals agreed that people with Long COVID symptoms experiences problems in self-care, mobility issues and return to work. 86.9% Health professionals agreed that rehabilitation is required for Long COVID symptoms.75.5% Health professionals agreed that Long COVID symptoms can be cured. Another study showed that 62.3% of respondents had more favorable attitudes about COVID-19 (Ferdous et al., 2020) while 73.81% participants showed a positive attitude on Covid 19 in other studies (Chen et al., 2022).

In our findings Attitude is associated with gender, profession and education which showed statistical significance. Other study described gender, Education, Job service and Knowledge is associated with attitude toward COVID 19 (Hossain et al., 2021).

We found a good practice for Long COVID symptoms among health professionals. 71.6% health professionals intended to educate people with Long COVID about resuming everyday activities conservatively at an appropriate pace within the limit of current symptoms.60.8% Health professionals intended to monitor heart rate for managing fatigue and post exertion malaise 50% health professionals intended to

practice “stop-rest-pace” approach to avoid exacerbation of symptoms. 71.9% participants intended check post exertion symptoms during physical activity. In another study 55.2% of responders reported more frequent COVID-19 practices (Ferdous et al., 2020) which shows markedly reduced practice in compare to our study.

In our study practice related to Long COVID was associated with profession, education, work position and clinical experience while other study describes practice for COVID 19 was associated with female gender, younger age, family income, urban area, education and positive attitude (Ferdous et al., 2020). Another study revealed there was no significant relationship between knowledge and practice, however there was a significant relationship between practice and fear scores (Hossain et al., 2021). This shows difference from our study because there is a difference in practice of Long COVID from COVID 19 also an important factor is our study evaluated practice of health professionals rather than general population.

This study showed that Health Professionals who have good and excellent knowledge about Long COVID has positive Attitude and sound Practice over Long COVID. Similar to our findings another study shows knowledge scores were found to be significantly associated with positive attitudes and safe practices toward COVID-19 (Zhong et al., 2020).

This study was conducted with 306 participants among them 34.6% was Male and 65.4% was Female within them Physician was 23.2%, Nurse was 36.6%, Physiotherapist was 23.9%, Occupational Therapist was 8.8%, Speech & Language Therapist was 4.6% and 2.9% was others Health Professionals. Other studies for COVID 19 KAP received more response from males (54.1%) than females (45.9%) (Hossain et al., 2021) Another study received more response from female (61.2%) than male (38.8%) (Peng et al., 2020).

Educational status for total participants was Diploma 34.6%, Bachelor’s Degree 42.8% and Postgraduate/ Master’s Degree 22.5%. 59.5% Health professional’s work position was in a Tertiary Care Hospital and 40.5% Health professional’s work position was in a Rehabilitation Center.

Among total participants 66.7% Health Professional’s clinical experience was in between 1-5 years, 16.3% was in between 6-10 years, 8.8% was in between 11-15 years, 4.6% was in between 16-20 years, 2.9% was in between 21-25 years, 0.3% was in between 26-30 years and 0.3% was in between 36-40 years of clinical experience.

Within the total participants 17.3% was diagnosed with COVID Positive among them 16.3% received home management and 1% received Hospital management. Other studies have described Long COVID symptoms among respondents who received home management (Cabrera et al., 2021).

Long COVID is a global public health concern after COVID 19 pandemic subsequently which has grown to be a significant area of study in the health system development. Due to the cross-sectional nature of this study, we view it as a preliminary investigation that has the potential to provide light on a number of vital aspects connected to Health Professional's Knowledge, Attitude and Practice about Long COVID. The obtained results may assist in the development of strategies to strengthen health care service and combat this emerging clinical crisis.

5.2 Limitations

The samples were collected only from CRP and EMCH at Savar and the sample size was small, therefore, it was not possible to generalize the study's findings to all Bangladeshi health professionals.

The number of health professionals was not equally disposed in accordance to specialty thence we cannot distinguish the findings for a single group of participants.

A convenience sampling technique was used that was not reflecting the wider population under the study.

As this was the first study of its kind to be undertaken in this situation, there was scant evidence to support the findings.

6.1 Conclusion

Despite the study's limitations and the limited sample size, this study offers insightful information about the level of Knowledge, Attitude and Practice of Long COVID among Health Professionals. According to the survey, the majority of health professionals had appropriate knowledge levels, which were directly and strongly related to age, gender, profession, education, and job position. There were positive attitudes among health professionals regarding the rehabilitation and cure of Long COVID and the impact of symptoms related to Long COVID which was associated with gender, profession and education. There was good practice for long COVID among health professionals and were significantly related to gender, profession, education, work position and clinical experience.

This study shows mediocrity knowledge of Health professionals which is passable but yet to enhance. We found auspicious attitude of health professionals in relation to Long COVID which need to be veritable and favorable practice of health professionals which is yet to progress and there is a need of implementation and maintenance of suitable practice for long COVID.

This study postulated that increasing Knowledge of Long COVID will help to consolidate attitude toward Long COVID and induce suitable practice for Long COVID.

6.2 Recommendation

The aim of the study was to evaluate Knowledge, Attitude and Practice regarding Long COVID among Health Professionals. Despite certain limitations, the researcher highlighted some further steps that could be made to improve the success of future studies. The main recommendations would be as follow:

To enable the power of generalization of the results, the random sampling technique rather than the convenience sampling technique would be further chosen.

The duration of the study was relatively short, so in future wider time would be taken for conducting the study.

Investigator used 306 participants as the sample of this study, in future the sample size would be more.

In this study, the investigator took the participants only from two selected hospital of Savar as a sample for the study.

So, to ensure the generalizability of this study, the researcher therefore highly advised including health experts from all around Bangladesh in future research.

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Appendix

Informed consent

(Please read carefully)

Assalamualaikum, my name is **Razwana Tasnim Runa** student of B.Sc in Physiotherapy at Bangladesh Health Professions Institute (BHPI). I am conducting a study for partial fulfillment of Bachelor of Science in Physiotherapy degree entitled, “**Knowledge, Attitude and Practice Regarding Long COVID among Health Professionals**”. For this study purpose I would like to know about some information. You will answer some questions which are mentioned in this form. This will take approximately 10-15 minutes.

I would like to inform you that this is entirely a professional study and will not be used for any other purpose. All the 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 secure. 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.

If you have any query about the study or your right as a participant, you may contact with my supervisor **Kazi Md Amran Hossain**, Lecturer of Bangladesh Health Professions Institute (BHPI), CRP, Savar, Dhaka-1343 (Mob No: 01735661492)

If you want to clarify with BHPI IRB, you can contact with **Md. Millat Hossain**, Assistant Professor, Department of Rehabilitation Science, Member Secretary, Institutional Review Board (IRB), BHPI, CRP, Savar, Dhaka-1343. (Email: millatcbr@yahoo.com)

So, may I have your consent to proceed with the interview? *(Put a tick mark)*

Yes

No

I.....have read and understand the contents of the form.

I agree to participate in the research without any force.

Date:

Questionnaire

Part-I (Particulars Information and Socio Demographic Questions)

Q.N.	Questions	Response/Answer
1.1	Date of Interview:	
1.2	Mobile Number (Optional):	
1.3	Address:	

Please select your correct answer and mark the answer through circle “○” beside code

Q.N.	Questions	Response/Answer	Code
1.4	Age Years	
1.5	Gender	Male Female	01 02
1.6	Marital status	Married Unmarried Widow Separated	01 02 03 04
1.7	Profession	Physician Nurse Physiotherapist Occupational Therapist Speech and Language Therapist Others (please write)	01 02 03 04 05 06
1.8	Education	Diploma Bachelor's Degree Post Graduate/Master's Degree PhD Degree	01 02 03 04
1.9	Current Work Position	Primary care hospital Secondary care hospital Tertiary care hospital Rehabilitation Centre Others (please write)	01 02 03 04
1.10	How many years have you been in practice? Years	

Part-II (COVID Related Experience)

Q.N.	Questions	Response/Answer	Code
2.1	Have you been Diagnosed with Covid-19?	Yes No	01 02
2.2	If yes, mention date and treatment received.	Date..... Treatment.....	
2.3	Taken covid19 Vaccine?	Yes No	01 02
2.4	If yes, how many doses?	Write in Number	
2.5	Date of 1st dose (<i>If taken</i>)		
2.6	Date of 2nd dose (<i>If taken</i>)		
2.7	Date of 3 rd dose (<i>If taken</i>)		
2.8	Do you have any persistent symptoms?	Yes No	01 02
2.9	If yes, please mention symptoms.		

Part-III (Knowledge)

Please select your correct answer and mark the answer through circle “  ” beside code

Q.N.	Statement	Response/Answer	Code
3.1	Common symptoms of long covid are fatigue and exertion induced dyspnea.	True False I don't know	01 02 03
3.2	Long covid symptoms commence usually three months from the onset of covid-19 infection.	True False I don't know	01 02 03
3.3	Elderly people are on risk of long covid.	True False I don't know	01 02 03
3.4	Long covid have multisystemic manifestations.	True False I don't know	01 02 03
3.5	Long covid affects only RT-PCR test positive patients.	True False I don't know	01 02 03
3.6	Long covid symptoms never fluctuate or relapse.	True False I don't know	01 02 03
3.7	Exercise and healthy lifestyle cannot mitigate long covid symptoms.	True False I don't know	01 02 03
3.8	Females are more affected by long covid as compared to male.	True False I don't know	01 02 03
3.9	Long covid Symptoms lasts nearly for 2 months or more.	True False I don't know	01 02 03
3.10	Physical therapy and rehabilitation interventions helps to manage long covid symptoms.	True False I don't know	01 02 03

Part-IV (Attitude)

Please select your correct answer and mark the answer through circle “ ” beside code

Q.N.	Questions	Response/Answer	Code
4.1	Do you agree that people with long covid symptoms experiences problems in self-care, mobility issues and return to work?	Agree	01
		Disagree	02
		Undecided	03
4.2	Do you agree that rehabilitation is required for long covid symptoms?	Agree	01
		Disagree	02
		Undecided	03
4.3	Do you agree that long covid symptoms can be cured?	Agree	01
		Disagree	02
		Undecided	03

Part-V (Practice)

Please select your correct answer and mark the answer through circle “ ” beside code

Q.N.	Questions	Response/Answer	Code
5.1	Will you educate people with long covid about resuming everyday activities conservatively at an appropriate pace within the limits of current symptoms?	Yes	01
		No	02
		Sometimes	03
5.2	Will you suggest to monitor heart rate for managing fatigue and post exertion malaise?	Yes	01
		No	02
		Sometimes	03
5.3	Will you apply “stop- rest- pace” approach to avoid exacerbation of symptoms?	Yes	01
		No	02
		Sometimes	03
5.4	During physical activity will you carefully check post exertional symptoms?	Yes	01
		No	02
		Sometimes	03

Permission Letter

Date: 05 March, 2022

To

The Head of Program

Centre for the Rehabilitation of The Paralysed (CRP)

Through: Head, Department of Physiotherapy, BHPI

Subject: Prayer for seeking permission to collect data for conducting research project.

Sir,

With due respect and humble submission to state that I am RazowanaTasnim, a student of 4th year B. Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). The Ethical committee has approved my research project entitled: **“Knowledge, Attitude and Practice Regarding Long COVID among Health Professionals”** under the supervision of Kazi Md Amran Hossain, Lecturer, Department of Physiotherapy, BHPI, CRP, Savar, Dhaka-1343. I want to collect data from the health professionals of CRP for my research project. So, I need your permission to collect data from CRP. I would like to assure that anything of the study will not be harmful for the participants.

I, therefore pray and hope that your honor would be kind enough to approve my appeal and give me permission to start data collection and oblige thereby.

Sincerely

Razowana Tasnim

RazowanaTasnim

4th professional B.Sc. in Physiotherapy

Roll: 17, Session: 2016-17, ID:112160339

Recommended & Forwarded

Shofiq

05.03.22

Md. Shofiqui Islam
Associate Professor & Head
Department of Physiotherapy
Bangladesh Health Professions Institute (BHPI)
CRP, Chapain, Savar, Dhaka-1343

Forwarded

Forwarded & Approved
AM
05/03/22

Approved
Shafiq
05/03/22
SHAHINA SULTANA
Deputy Head of Programs
Programs Division, CRP

Forwarded

AM
05/03/22

Kazi Md. Amran Hossain
Dept. of Physiotherapy
BHPI, CRP, Savar, Dhaka-1343

Permission Letter

Date: 27 February, 2022

To

The CEO

Enam Medical College Hospital

Savar, Dhaka

Through: Head, Department of Physiotherapy, BHPI

Subject: Prayer for seeking permission to collect data for conducting research project.

Sir,

With due respect and humble submission to state that I am Razowana Tasnim, a student of 4th year B. Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). The Ethical committee has approved my research project entitled: "**Knowledge, Attitude and Practice Regarding Long COVID among Health Professionals**" under the supervision of Kazi Md Amran Hossain, Lecturer, Department of Physiotherapy, BHPI, CRP, Savar, Dhaka-1343. I want to collect data from health professionals of Enam Medical College Hospital for my research project. So, I need your permission to collect data from Enam Medical College Hospital. I would like to assure that anything of the study will not be harmful for the participants.

I, therefore pray and hope that your honor would be kind enough to approve my appeal and give me permission to start data collection and oblige thereby.

Sincerely

Razowana Tasnim

Razowana Tasnim

4th professional B.Sc. in Physiotherapy

Roll: 17, Session: 2016-17, ID:112160339

Forward
[Signature]

Dr. A N M Mashud Rana (PT)
MPH (NCD-ASAUB), BSPT (BHPI-DU)
Consultant Physiotherapist & Head
Department of Physiotherapy and Rehabilitation
Enam Medical College Hospital

Approved
[Signature]
12/2/2022
Dr. Anwarul Quader Nazim, PhD
Chief Executive Officer (CEO)
Enam Medical College & Hospital

The Chairman
Institutional Review Board (IRB)
Bangladesh Health Professions Institute (BHPI), CRP
Savar, Dhaka-1343, Bangladesh
Subject: Application for review and ethical approval.

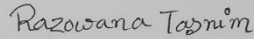
Dear Sir,

With due respect, I am Razowana Tasnim Runa, student of final year B.Sc. in Physiotherapy program at Bangladesh Health Professions Institute (BHPI) the academic institute of Centre for the Rehabilitation of the Paralyzed (CRP) under the Faculty of Medicine, University of Dhaka. As per the course curriculum, I have to conduct a research project entitled "**Knowledge, Attitude and Practice Regarding Long COVID among Health Professionals**" under the supervision of K M Amran Hossain, Lecturer, Department of Physiotherapy, BHPI.

The purpose of the study is to evaluate Knowledge, Attitude and Practice regarding long covid among health professionals. The study involves face-to-face and/or Online (Google form) interview by using questionnaire to explore Knowledge, Attitude and Practice among health professionals in selected hospitals that may take 10 to 15 minutes to fill in the questionnaire and there is no likelihood of any harm to the participants. Data collectors will receive informed consent from all participants and the collected data will be kept confidential.

Therefore, I look forward to having your kind approval for the research project and to start data collection. I can also assure you that I will maintain all the requirements for study.

Sincerely,



Razowana Tasnim Runa
Final Year B.Sc. in Physiotherapy
Session: 2016 – 2017,
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

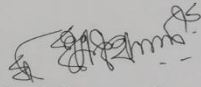
Thesis presentation date: 17th October 2021



Head of Department
B.Sc. in Physiotherapy, BHPI.

Md. Shofiqui Islam
Associate Professor & Head
Department of Physiotherapy
Bangladesh Health Professions Institute (BHPI)
CRP, Chapein, Savar, Dhaka-1343

Recommendation from the Supervisor



Kazi Md. Amran Hossain,
Lecturer
Department of Physiotherapy, BHPI



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

Ref:

Date:

CRP/BHPI/IRB/02/2022/552

20/02/2022

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

Subject: Approval of the research project proposal “**Knowledge, Attitude and Practice Regarding Long COVID among Health Professionals**” by ethics committee.

Dear Razowana Tasnim Runa,

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 Kazi Md. Amran Hossain as thesis supervisor. The Following documents have been reviewed and approved:

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

The purpose of the study is to evaluate Knowledge, Attitude and Practice regarding long covid among health professionals. 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 October 12, 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

CRP-Chapain, Savar, Dhaka-1343, Tel : 7745464-5, 7741404

E-mail : principal-bhpi@crp-bangladesh.org, Web: bhpi.edu.bd, www.crp-bangladesh.org